The

April 1933

CQ COMMERCIAL RADIO MAGAZINE

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Antenna For Range Beacons

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Modern Shipboard Installation

High Frequency Schedules

American Radio Telegraphists Association News

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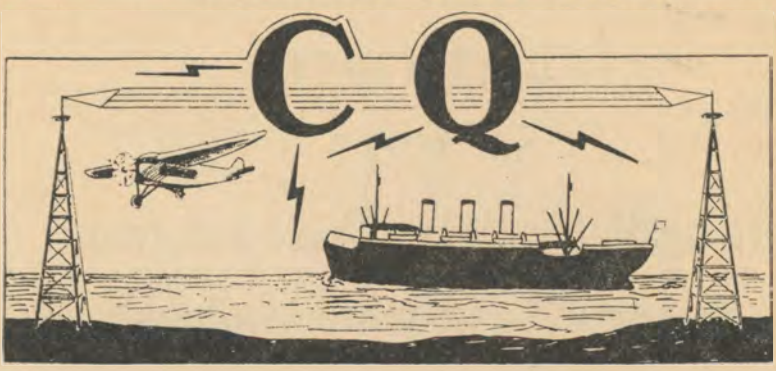

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JAMES J. DELANEY, Editor L. D. McGEADY, Bus. Mgr.

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A Crying Need

A committee of the Institute of Electrical Engineers is at work in an effort to standardize general designations of vacuum tubes used in the electric power field.

A conservative estimate of the sales of vacuum tubes used in the radio field during the year 1929 placed the figure at $180,000,000 worth. How many times this is greater than the amount used in the electric power field in connection with vacuum tubes may easily be called thousands.

All attempts of whatever nature to change the UV, the G's, the C's, the P's, or the multiple of other designations of radio tubes each manufactured to function the same have been unsuccessful.

An industry which in total sales volume for the year 1920 was only $2,000,000, but in the year 1929 the peak mounted to over $800,000,000, has been unable to clean its own house.

In 1929 the largest seller of radio tubes in the country, The Radio Corporation of America, saw fit to extend licenses to the so-called independent manufacturer of radio tubes, but did not see fit to either grant or insist on a standard designation by the licensed manufacturers of vacuum tubes manufactured by the different manufacturers, but intended for the same purpose. Even though in the manufacture of these vacuum tubes the same standards were intended. Then there was the picture of nineteen licensee radio tube manufacturers each with an individual tube designation for a radio tube intended to function identical.

In 1930 by the unification agreement between the General Electric Company, the Westinghouse Electric and Manufacturing Company, and the Radio Corporation of America whereby all radio vacuum tube manufacturing was to be under one firm, the RCA Radiotron Company, Inc., the opportunity was again presented to the Radio Corporation getting together with its licensees for a common designation of vacuum tubes intended for the same purpose. But, again nothing was done in this direction.

Today, we have the sorry sight of Electron Tubes used in one form or another for more than sixty different purposes of Governmental activities alone, such as Army field transmitters, fixed stations, aircraft control, and Subagneous Sound ranging. There is Navy Compass, depth measurement, facsimile transmission, and aircraft control. Other fields are frequency precision measurement, time signals, submarine and mine location, electric control motors, repeater compasses, torpedo direction, detonation control, and triangulation.

The Department of Commerce finds use in its Bureau of Standards, light houses, aircraft beacons, and radio compasses.

The Department of Interior finds them useful in measurement of rainfall, wind velocity, sunshine recording, and temperature recording.

Just a few of the general uses of electronic tubes are in broadcasting, public address, television, ship, police and fire service, sound pictures, repeater systems, picture transmission, aircraft direction finders, machine control, railway signal work, street traffic control, counting and grading work, inspection and assaying of metals, theatre dimmers, oil burner control, and broadcast receivers.

From this it is seen that the twelve to fourteen million home radio receivers in use today, while representing approximately 65,000,000 radio vacuum tubes, is only part of the crying need for standardization of designation of vacuum tubes.

Since 1927, when the general use of A. C radio tubes became general, and tuned radio frequency patent licenses were granted to independent radio set manufacturers, by the Radio Corporation, supplemented in 1930 to include super heterodyne receiving sets the problem of proper tube designation has been a vital one for radio receiver manufacturers. At first the license was limited by the so called "Clause 9" so that the radio set manufacturers were compelled by the terms of the license to the use of Radio Corporation of America, or E. T. Cunningham vacuum tubes, but later by a ruling of the Federal Courts terming this monopoly the field was thrown wide open so that a manufacturer was in a position to designate any make or makes of vacuum tubes to be used in their receivers. But, then the problem became one of designating a certain tube by manufacturers' individual code, or listing from one to twenty different manufacturers' individual code numbers on vacuum tubes.

It seems a strange setting when General and Westinghouse can at such an early point of development of vacuum tube work as the present get together for general designation, in the power field, but a field that has progressed as far as has the radio field cannot come to agreement. The general argument presented is that the class of firms involved is entirely different. The amount of money expended for advertising of the varied types of tubes by code number is too great to allow participation. It may be that this very attitude has tended to make of the radio field today exactly the conditions protested.

The bitterness of the patent litigation in the radio vacuum tube industry started as early as the suits against deForest restraining the manufacture of the three element vacuum tube, because there were Fleming patents on the two element tube. The suits against the Radio Audion Company controlled by Elman D. Myers, the Langmuire patent suits upheld in many trial cases and later invalidated as only an improvement of manufacture it would seem show the hopelessness of progress through the medium of court manipulation and legal procedure.

A Century of Progress

On June 1, 1933, a "World's Fair" under the official title of A CENTURY OF PROGRESS will make its bow to the public, at Chicago, Ill.

Railroads will offer special excursion rates. The exposition will tell by easy stages and in simple form the story of scientific discoveries, their application to industry and the resultant transformation that has made the world of today so different from the world of a century ago.

Not only the larger industries of this country but those of the entire world will be represented here. The exhibition is within easy access of the downtown business center of the city. Chicago will do its utmost to make the stranger welcome. The Municipal administration there is at work daily to bring to the highest point this exhibit which unfortunately falls during a bad business period.

A person not otherwise employed, but with means to take care of his daily needs at any other point of the country, will find it to his lasting advantage to take advantage of the times by spending as much time as is possible in just browsing around absorbing from these displays what may otherwise never present itself in the way of enlightenment. A post graduate course in science may easily be had for the asking and observing, as at no other possible point in the country will such an assemblage be found.

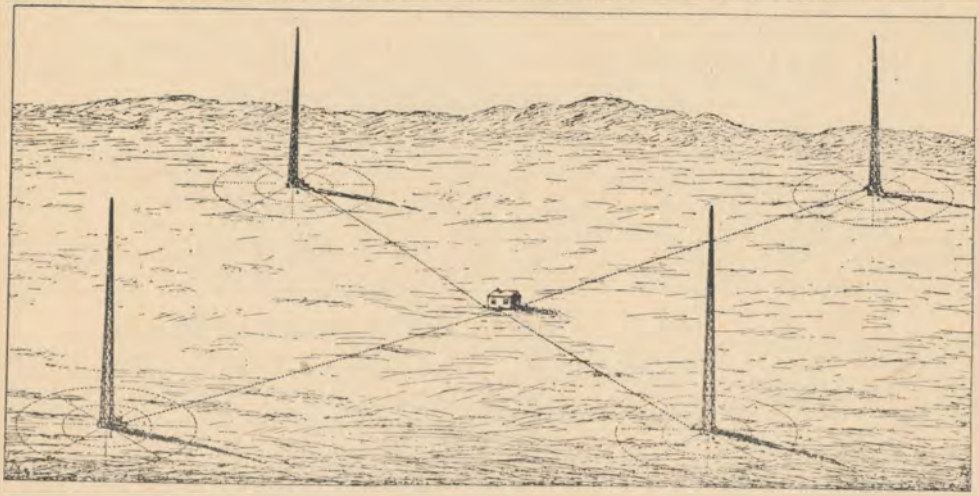
Transmission-Line Antenna Developed

By W. E. JACKSON

The transmission line or T-L antenna system was developed by the Aeronautics Branch of the Department of Commerce for use with radio range beacons as a means of eliminating troublesome night effects which took the form of variations of the courses from their true positions chiefly at night.

Exhaustive studies of the night effects disclosed that they were caused by the presence of horizontally polarized components in the transmitted wave (these components being produced by currents in the horizontal members of the transmitting antenna), that the magnitude of the fluctuation varies in an irregular manner with time and with distance from the beacon stations, and the fluctuations are identical for both the aural and visual systems of radio range beacons.

The new type antenna, which is now being installed at forty-five radio range beacons on the Federal airways system, consists of substituting for the conventional loop antennas two



Schematic sketch showing general arrangement of a complete transmission-line antenna for a radio range beacon

pairs of vertical antennas so excited as to produce a radiated space pattern which is the same as that created by the loops. Experiments showed that this system is practically free from night effects.

One of the additional desirable features is the simplicity with which courses can be aligned with the airways. Instead of requiring an additional control antenna to shift the courses, a slight change in phase of the current in one antenna with respect to the others produces a change in alignment of the four courses.

The existence of variations at night is inherent in every system of navigation by radio which makes use of the directional properties of the loop antenna. In the radio range beacon system, these night effects take the form of rapid and irregular variation of the indicated beacon courses, so that an airplane following the true course will receive in varying amounts, off course indications to the right, off course indications to the left, and on course indications. When the variations are less than about three degrees (that is, when the maximum fluctuations in the course indications received on the airplane do not exceed three degrees to the right or left of the true course), it is feasible for the pilot to follow the true course by averaging a large number of successive course indications, but only with a fair degree of accuracy. When the variations exceed 3 degrees by an appreciable amount, it becomes very difficult, if not impossible, for the pilot to follow the true course, even by the averaging process. Night effects of such magnitude are common over all types of terrain and particularly so over mountainous country, beginning at distances of from 20 to 50 miles from the range-beacon station. These facts, definitely established by research work to be characteristic of range beacons employing the loop-antenna system, indicated clearly the necessity of developing a practical means which could be applied to beacons for the elimination of night variations.

It has been found that the magnitude of the variations is greatest during the winter night, next during the summer night, next during the winter day (particularly within a few hours of sunrise and sunset), and finally, is least during the summer day. Because of the negligible occurrence of such effects during the daytime, the term "night effects" has come into use. Other factors, in addition to time and season of the year, have considerable influence upon the magnitude of night effects. Some of these are: Nature of the terrain over which the range beacon wave is transmitted, location of the transmitting and receiving points, distance of the re-

for Use With Radio Range Beacons

Radio Engineer, Aeronautics Branch, Department of Commerce

ceiving location from the transmitting station and form of the receiving antenna.

In general, the night effects are most pronounced over mountainous terrain. The magnitude of the effects increases with distance of the receiving point from the transmitting station.

The type of signal used for the course indications has no bearing upon the magnitude of the effects. A series of ground measurements made on the Washington and Bellefonte aural beacons and the College Park and Bellefonte visual beacons, at distances from the respective beacon stations ranging from 35 to 100 miles, showed the magnitude of the variations with the two types of beacons to be the same. Full corroboration of these results was obtained in a large number of night test flights on the range beacons located on the midcontinent airway between Amarillo, Texas, and Los Angeles, California. The range beacons were tested under identical conditions, first using aural and then visual operation, and the average night effects were found to be the same with both.

The reason that the effects are greater during the winter night than during the summer night lies in the greater height of the Kennelly-Heaviside layer during the winter night. The fact that the night effects increase with increasing distance from the beacon station is explained on the basis that there is greater diminution of the ground wave with increased distance from the stations and consequently the ratio of horizontal to vertical components at the receiving point becomes greater. Similarly, the greater severity of night effects over mountainous terrain is caused by the more rapid diminution of the ground wave for a given distance from the beacon station.

On the basis of this analysis, it might appear that to eliminate the effect of the horizontal component it is only necessary to employ a receiving antenna which would not be influenced by a horizontally polarized electric field. A vertical receiving antenna satisfies this requirement. The introduction of the vertical pole receiving antenna in 1927 was found to provide considerable reduction in night effects. Their elimination was not complete, however, for the reason that upon reflection of the sky wave from the Kennelly-Heaviside layer, a rotation of the components of the sky wave takes place, so that the original horizontal component becomes vertical in part and can effect a vertical receiving antenna. It follows that the only solution is to eliminate the radiation of the horizontal component at the transmitting end. Since this component is produced by the current passing through the horizontal elements of the transmitting loop antennas, radiation from these elements must be prevented.

The significant element of the antenna arrangement finally adopted, after several other arrangements were experimented with and found insufficient, is the particular means employed to confine the radiation to the four vertical antennas. A two-wire parallel conductor transmission line is used to feed power from the goniometer to each vertical antenna, these transmission lines being of such a nature as not to radiate at all. The efficient means for eliminating horizontal radiation thus provided makes it feasible to reduce the residual course variations to smaller values than was possible with any of the early arrangements. The use of transmission lines also affords efficient transfer of power from the goniometer to the vertical antennas. Transmission line technique was not available to the early workers, being a development of more recent years.

The two parallel wires comprising the transmission line may be considered to form a finite series of unit sections. If one end of the transmission line is terminated by a resistor equal to the surge impedance of the line and a voltage applied to the other end, an electric wave will be transmitted along the transmission line and will be entirely absorbed by the terminating resistor. No radiation from the transmission line will occur. If the terminating resistor is not equal to the line surge impedance, part of the wave reaching the resistor will be absorbed by it and part of the wave will be reflected back along the line. This in part sets up standing waves and causes radiation from the line. The surge impedance of the transmission line employed in the experiments was 80 ohms. The radio frequency transformers employed for coupling the transmission lines to the vertical antennas are accordingly designed so that the input impedance of each is exactly equivalent to a resistor of 80 ohms. In this way, radiation from the transmission lines is eliminated. To insure that this condition obtains exactly, an 80 ohms resistor is provided in each tuning box with a switch for connecting it across the terminating end of the transmission line (in place of the primary winding of the antenna coupling transformer). The line current is read, first with the resistor across the line and then with the transformer. The two currents should be exactly equal. If found to be unequal, a change is made in the number of primary turns of the transformer, which in turn alters the transformer input impedance to the desired value.

Variable inductors in series with each vertical antenna serve for tuning of the antenna to the radio frequency of the transmitting set. Very accurate tuning of the vertical antennas is required in connection with the alignment of the beacon courses with airway routes at arbitrary angles.

The general arrangement of a transmission-line antenna installation consists of four vertical antennas spaced at the corners of a square, working in pairs, so that one pair replaces one loop of the arrangement used in the past, and the other pair replaces the other loop antenna. The capacitance of each vertical antenna to ground is as large as possible, thereby securing as great an antenna current as possible. To this end, each vertical antenna is given some lateral dimensions. In the experimental installations, each vertical antenna consisted of 6 vertical wires arranged as elements of a cylinder 4 feet in diameter. In service installations insulated towers 125 feet high with the two towers of each pair spaced about 600 feet apart are used.

To insure a fixed low-ground resistance, an individual ground wire system is provided at the base of each vertical antenna. Each ground system consists of eight radial spokes of copper wire, 75 feet long which join directly under the vertical antenna.

The tuning boxes which house the antenna loading coils and the transmission line coupling transformer are located at the base of each

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TOURIST WIRELESS OPERATORS

By VERNON W. MINZEY

Some years ago there was printed in a Pacific Coast radio magazine an article called "The Wireless Operator and the Tourist." This article at that time had a strict application to the men who pounded brass in those days but, in some respects, is as true today as then. It is my intention, in this article, to translate the author's plea for better operators from his time to our own era in the greatest profession of the ages.

One remark made nowadays when an inquiry about a man's business is made is: "Oh he doesn't work, he's in the radio game." Laugh that off, you men on a one man ship who spend most of your time trying to QSP some traffic to your company's shore stations, and pick up more messages and TRS to QSP at other intervals.

Yes, a radio operator has an easy time of it. But joking aside, why do the other officers of a ship get the idea that "Sparks" has such an easy job? Is it because his work doesn't require him to be out on deck while on watch? Or is it just an expression of a man's sense of humor? No doubt the impression is partly due to the fact that his work is done quietly in his room while most of the others are asleep, and partly it is just "kidding," which has become a habit with some sea-going men, but the fact remains that some of them seriously believe that the radio operator gets by without doing much work.

Now the truth of the matter is that in some cases they are justified in their criticism. Every operator who ever saw the inside of a static room has had to listen to some "would-be" old-timer brag about how little work he got away with, or how he faked his log and missed his watches. It's an old story, and in many cases slightly exaggerated; nevertheless, while the operator himself may be "getting by" all right, his profession suffers. Officers remember, and criticise, the marine manager for the shipping company gradually begins to take it for granted (or already does) that the wireless operator is a necessary evil, (rating the rank of an officer because of his license, but not receiving even that treatment at times), who holds down the job of a tourist and gets paid for it.

This is one of the reasons today why the wireless operator is the poorest paid officer on the ship; why his rank, even his reliability, is sometimes questioned by those in command. And conditions will remain as they are today until the commercial wireless operator realizes that he is in a business, not on a tourist trip.

To be more specific than the author six years ago, whose article I am re-writing for our present day use, I wish to go over some of the reasons why the wireless operator should be an officer and receive recognition as such if he, individually, deserves it. At the minimum, he is expected and required to stand an eight-hour watch; his apparatus is complicated and its operation requires some education; he gets time signals, weather and hydrographical reports as aids to navigation; when it's foggy, the deck officers are completely dependent upon him for their bearings and the ship's safety; and in time of distress he is the only one aboard who can do anything for the safety of the crew. All this is part of the wireless operator's duty aboard ship, and when it is considered that, in the majority of cases, he is all alone with his responsibility; that while the deck officers and engineers can always get help from their associates when they are in doubt or trouble, he has to fight it out himself, we realize why "Sparks" should be an officer.

Do we receive that treatment in the majority of cases? No. At the present writing there are men serving as wireless operators and seamen, taking a trick at the wheel, for less than the pay of a United States Shipping Board sailor, who are the highest paid seamen in the world. Other instances of this type could also be cited but not here as this is a request for better wireless operators, not a charge against shipping companies and their practices.

Enough of theory; the fact still remains that lots of operators get by with the tourist stuff, and lots more claim they do, whether they do or not, all of which gives the profession one beautiful black eye in the sight of those who hold the radio operator's destiny in their hands,

while the more conscientious of the crowd labor unceasingly for the advancement of their chosen line of work.

As one of those who "go down to the sea in ships" to make a living, I wish to call on all of you who are, to stop being a "tourist" and remember that we are serving in one of the greatest professions of the age; and that the only way we may serve with credit is to do our duty faithfully, believe in ourselves and to "carry on" as wireless operators, and not tourists.

I wish to thank the author of the article "The Wireless Operator and the Tourist," which appeared in RADIO, December, 1926, for the original article and to beg his indulgence to the changes and additions made herein.

V. W. M.

PIONEER RADIO OPERATORS

By DR. LEE DE FOREST

Three pairs of headphones were hooked up in series, so that Ocker shouldn't enjoy all the fun alone (nor translate stray static into messages unchecked).

We heard not a peep until the train got out of the city jam and along the clear tracks across the river from East St. Louis. The top of the distant mast could just be discerned above the buildings on the East bank. Then the "Vs" began to rip in, "like a ton of bricks off the roof," as Ocker remarked. I had a pair on and waited to see the effect of Merchants Bridge. Sure enough, just as I had anticipated, as we watched the locomotive tender, baggage car and first coaches slowly turn the curve and enter into the steel boxframe of the bridge the signals began to grow weaker, finally fade to nothing. And then as the first coaches emerged on the Illinois side of the river the welcome signals again began, louder and louder until our last car was again in the open.

As the flyer sped north the strength of signals began to slowly fade. Suddenly, when some twenty miles north, they had totally vanished. Keenly disappointed I glanced out the window—we were amid the low hills, far from the river's side. But Ocker, having already copied several messages addressed to the road officials aboard, was by no means satisfied, listened intently, doggedly. He knew that his brother O. B. was still carrying on as ordered. Suddenly the low pitched rattle of the call began again—grew loud. I looked out of the car window. There lay "Ole Man River" right along side again. After a few hundred yards the tracks again led inland, and once more the call faded away into silence. Surely this was the last we should hear until nearing Chicago. But no—again the old familiar sounds, and sure enough again we were approaching the river side. This astonishing phenomenon was repeated three times, before the signals finally became too faint even for Ocker's ears—at a distance of fifty miles north of St. Louis.

To me it was a beautiful demonstration of the truth of the theory, which wireless pioneers had already accepted, that these mysterious waves follow water in preference to dry soil; that a relatively strong field of force follows the winding river and its moist conducting banks, for much greater distances than along parallel lines over dry country. Also that the mass of track-side wires played a most important part in this "wireless" transmission, and doubtless the rails also, which explained why our long, relatively low horizontal receiving antenna could pick up the signals from a vertical transmitter over such surprising distances, and even if the train were travelling in a direction at right angles to the radial lines of wave propagation from the transmitter. And that observation of the total fading and restoring of strong signals as our train entered and emerged from Merchants Bridge completed the series of history-making, theory-confirming observations on that momentous day. Read what the Chicago papers had to say of our afternoon's work the following morning: "With Alton Limited speeding at a rate of almost a mile a minute" (not so fast, Mr. Editor, compared with 186,000 per second!) "the first wireless telegram press message ever sent from a railway train was flashed to the Examiner office yesterday afternoon at a distance of forty-one miles from Chicago." (Ignore the slight reportorial error as to the direction in which the message was sent and received!) "From that time until the train was in the Union Depot constant communication between the flier and the city was maintained by means of the DeForest Wireless System, and the beginning of a new era in railway safety signals was inaugurated. By means of the wireless telegraph it is now possible not only for a train to be in regular communication with every station on the line, but also for two moving trains to keep constantly in touch with one another.

"District Passenger Agent Walker and Wm. H. Ocker, Manager of the DeForest Company in Chicago, with other officials of the Chicago and Alton, were charmed with the success of the experiment, and its adoption as a safety method is assured. Shortly after leaving Dwight, seventy-three miles out of Chicago, the first connection with this city was established. The dots and dashes for a time came faintly, but before Joliet was reached the code was distinct, and first over the wires came this message from the Examiner: 'Rush bulletin on success of the test of wireless telegraph'. The reply filed from the train at Joliet read as follows: 'Examiner message first received. DeForest System on Alton Limited working perfectly.' From that time until the train drew into the Union Depot the instruments were kept busy sending (sic) and receiving messages.

"President Felton and Gen'l. Passenger Agent Carlton inquired from their Chicago offices as to the success of the test, while newspapers and others kept the operators busy answering queries.

Success Is Assured

" 'The fact that we can get in touch with any of our stations at a distance of forty-one miles,' said Mr. Ocker, 'is only a slight indication of what we can do when the trains are properly equipped and when other substations are established. Now we have relay stations only at Chicago, Springfield, and St. Louis, but later we will have them at regular intervals along the road. The receivers and wires on this train are for experimental purposes only. When we have proper wires and stations on the train it will be an easy matter to keep every passenger and freight train on the system in close touch, not only with the dispatchers, but with one another, and then I cannot see where an accident is possible.'

"The experiment of yesterday has demonstrated for the first time that a wireless plant can be operated without the high towers heretofore considered necessary. While these are indispensable at the terminal stations of each circuit, it has been demonstrated that they are not essential for accuracy of transmission at short distances, and on this account the system is applicable to railroad work."

The historic tests here described took place in June, 1905. They were carried on for some days. The Alton officials were thereby entirely convinced as to the practicability of wireless on fast traveling trains. Plans were eagerly discussed by their telegraph officials and myself, looking towards the permanent installation

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A MODERN SHIPBOARD RADIO-

By I. F. BYRNES

It is a rather difficult assignment to be asked by the Editor of "CQ" to describe, for a reader group of professional operators, a modern shipboard radio transmitter. Not that there is any dearth of material, but it is my experience that professional operators are usually well informed on developments affecting their daily work. There seems little to write about, therefore, that might not be common knowledge to many of my readers. I mention this at the outset because, to the reader who may be working with spark equipment I wish particularly to avoid the impression that I assume his unfamiliarity with modern vacuum tube apparatus. With the understanding that the following is presented in the nature of a 'review, therefore, I shall describe the features of the RCA radiotelegraph transmitter model ET-3674.

This transmitter provides in a single unit the equipment necessary for signalling by CW or ICW on intermediate frequencies in the band between 375 and 500 kcs. and on high frequencies from 5500 to 17,150 kcs. The dimensions are such that it may readily be installed in the average radio room on ships or private yachts.

The power delivered to the antenna is 500 watts when working into an antenna having a resistance in excess of 4 ohms. The frequency may be continuously varied within the limits given above by means of simple controls on the front of the panel. An antenna of the following constants should be used.

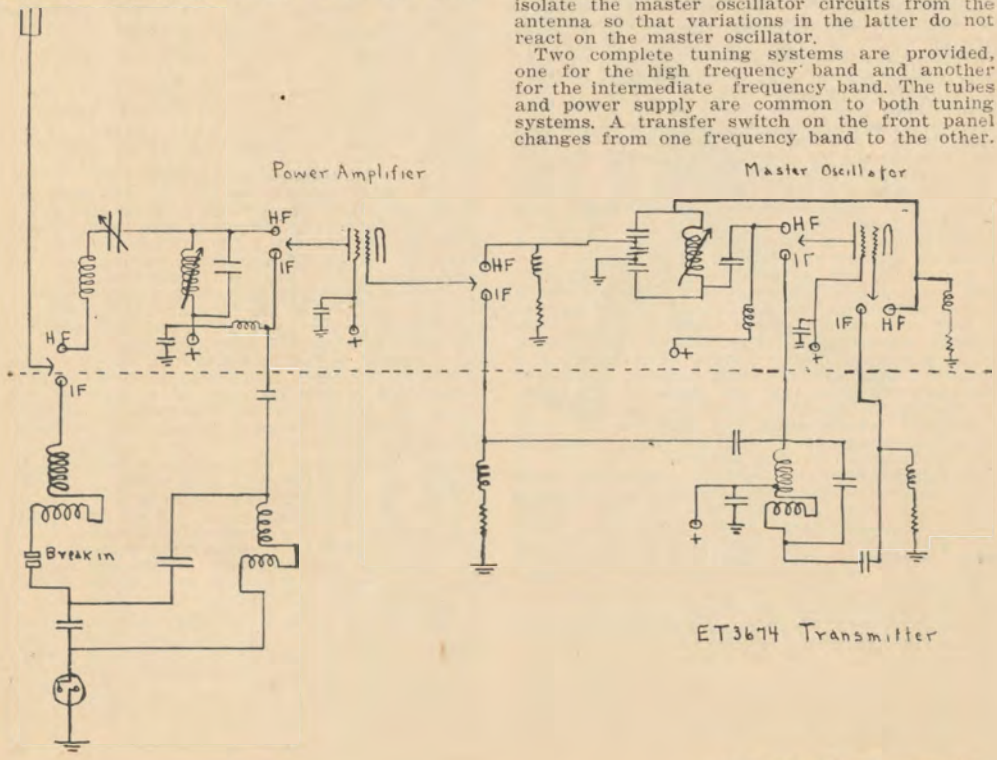
Electrostatic capacity .0006 to .0015 mfd.
Resistance 2 to 10 ohms.
Fundamental wave length 300 to 400 meters.

This transmitter is arranged for signalling by telegraph, using either CW or ICW. ICW is obtained by means of an audio oscillator. A switch operated from the front of the panel changes from CW to ICW. The following Radiotrons are used:

1 UX-860 as master oscillator.
1 UX-860 as audio oscillator.
1 UX-861 as power amplifier.
6 UX-866 Rectifier tubes.

One of the paramount requirements of a radio transmitter for marine service is the maintenance of the output frequency within narrow limits. This is of special importance under conditions of shipboard vibration, and when rolling or pitching may cause slight changes in the antenna characteristics. In the ET-3674 transmitter the output frequency is determined by carefully designed master oscillator circuits, which however are not coupled to the antenna but instead are connected to the control grid of a screen grid power amplifier tube (UX-861). The screen circuits of the power amplifier tube isolate the master oscillator circuits from the antenna so that variations in the latter do not react on the master oscillator.

Two complete tuning systems are provided, one for the high frequency band and another for the intermediate frequency band. The tubes and power supply are common to both tuning systems. A transfer switch on the front panel changes from one frequency band to the other.



ET3674 Transmitter

TELEGRAPH TRANSMITTER

Chief Engineer, Radiomarine Corporation of America

The intermediate frequency tuning system uses a series fed Hartley circuit for the master oscillator, consisting of a variometer and a fixed tank circuit condenser. The entire intermediate frequency band is covered in one range on the tuning dial. The power amplifier circuit for the intermediate frequency band consists of a parallel fed radio frequency amplifier which obtains its excitation from a tapped point on the master oscillator tuning variometer. Its tuned tank circuit consists of a variometer, a tank circuit condenser and three antenna coupling condensers. The master oscillator and power amplifier variometers in the intermediate frequency band are gang tuned by a single control. The antenna is tuned in the intermediate frequency band by a tapped variometer which covers the entire band in one range of the tuning control. Adjustable capacity coupling is provided between the power amplifier tank and the antenna. The high frequency master oscillator uses a Colpitts circuit consisting of a variable inductance (rotating coil) and fixed capacitors.

In order to permit accurate setting of the high frequency assignments, the master oscillator tuning system provides 1000 easily read scale divisions. This is a considerable increase in the number of scale divisions on the master oscillator dial as compared with conventional design and makes it possible to accurately adjust the transmitter for the frequency on which it is desired to operate.

The power amplifier for the high frequency band consists of a series fed radio frequency amplifier, which obtains its grid excitation from the capacitor leg of the master oscillator tank circuit. The tuned amplifier circuit uses a variable inductance (rotating coil) similar to that in the master oscillator circuit. A fixed tank circuit condenser is used when tuning to frequencies below 10,000 kilocycles. For frequencies above 10,000 kilocycles, the only tank circuit capacity used is the inherent capacity of the power amplifier tube itself. The antenna is voltage fed through a loading inductance and a variable coupling condenser operated by a control on the front panel.

An audio oscillator provides screen grid modulation for ICW with a 700 cycle note. The audio oscillator uses one UX-860 tube in conjunction with an audio transformer and a tank circuit condenser.

A switch on the front panel connected to taps on the primary of the plate transformer provides a means of adjusting for operation on full power, medium power or low power.

This equipment can be supplied for operation from 110 volts D. C., 230 volts D. C., or from a 3 phase 60 cycle A. C. line, 110, 220 or 440 volts.

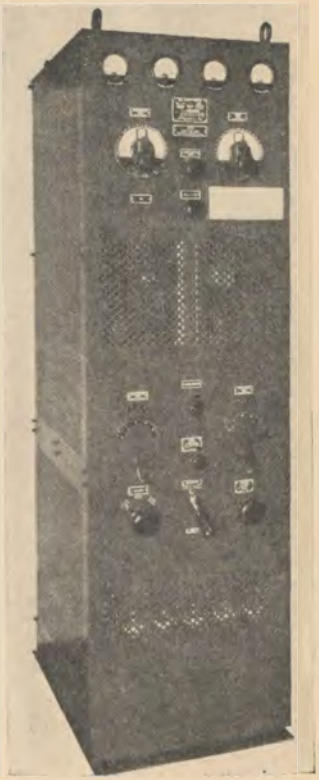
For operation from 110 volts D. C. a rotary converter and auto starter are supplied. For operation from 230 volts D C. a small auto transformer is used in addition to the rotary converter and starter.

For operation from a 3 phase 60 cycle A. C. line, the rotary converter and starter are unnecessary. An auto transformer is required to adapt the line voltage to the primaries of the plate and filament transformers and a small rectifier unit to furnish D. C. for the relays.

Power is supplied to the plates of the tubes at 3000 volts through a rectifier built into the base of the transmitter. This is a 3 phase full wave rectifier using 6 UX-866 mercury vapor rectifier tubes, which furnishes .5 amp at 3000 volts.

No high voltage rotating machinery is required and there is no high voltage wiring outside of the transmitter frame. This is a decided advantage in marine installations, as a combination of rotary converter and rectifier is more reliable under marine conditions than a motor generator delivering high voltage D. C. The equipment will operate satisfactorily with variations in the line voltage of plus or minus 10%.

A complete installation for operation from direct current consists of:



Transmitter.
Operator's control unit.
Rotary converter.
Automatic starter.
Key.
Auto transformer (when power supply is 230 volts D. C.).

(Continued on Page 28)

Tuned-Transformer Coupling Circuits

By

A. J. CHRISTOPHER

Member Technical Staff
Bell Telephone Laboratories

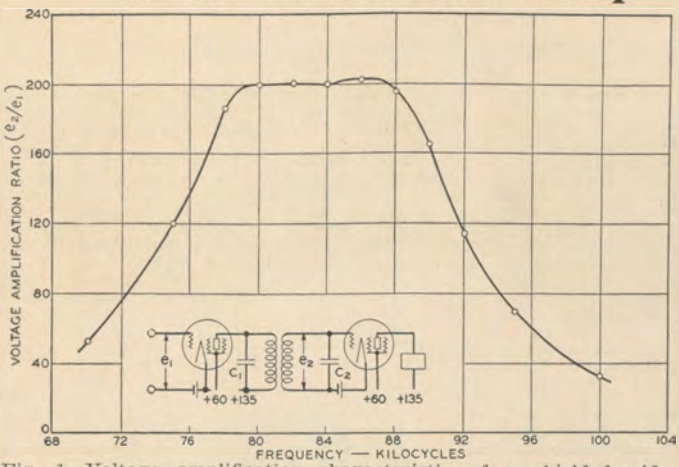


Fig. 1—Voltage amplification characteristic of a shielded-grid tube and a double-tuned transformer

Selective networks, employed to separate the various frequency bands, are fundamental to any carrier or radio system. They are in general preferably of the bandpass type, transmitting all frequencies between certain limits and greatly attenuating all those above or below these limits. Amplifiers are used, in addition, to raise the power level of the transmission band. Under some conditions, where the requirements are not severe, it has been possible to use single-tuned transformers, which, in conjunction with vacuum tubes, perform a satisfactory selection and amplification by themselves.

With this method, however, certain design characteristics make it impossible practically to obtain maximum amplification, sharp frequency discrimination, or the high quality required of high-grade carrier-telephone and radio systems. There has been a demand, therefore, for something with the simplicity and economy of these single-tuned transformers that has a high degree of frequency discrimination, combined with high quality transmission. To meet this demand there has been developed a variety of low-loss air-core transformers, which have both primary and secondary windings tuned with capacities. Air-core transformers were used because of their suitability and inexpensive construction. Definite relations have been obtained between the constants of the transformer windings, the tuning capacities, and the impedances of the circuits between which the transformer operates. Furthermore, it can be shown that a structure satisfying these relations is essentially a bandpass filter and has all of its elements properly proportioned to provide the desired

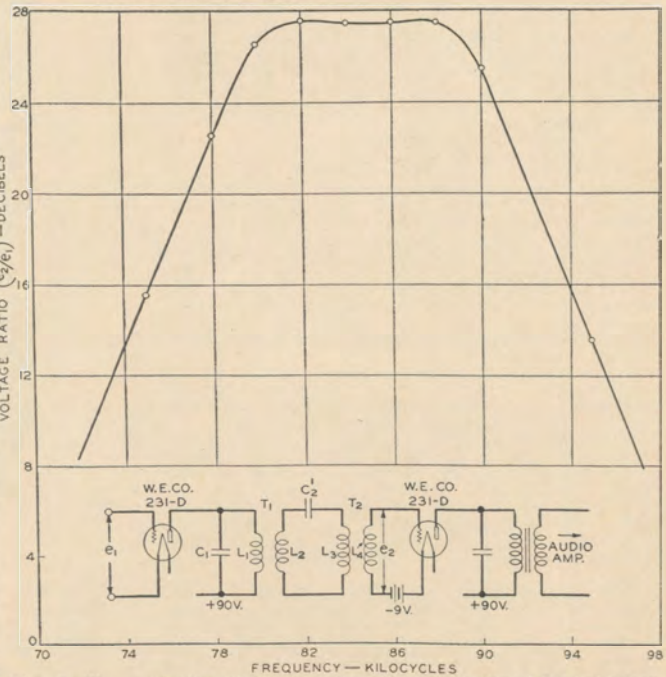


Fig. 2—Transmission characteristic of a triple-tuned transformer. Circuit schematic below

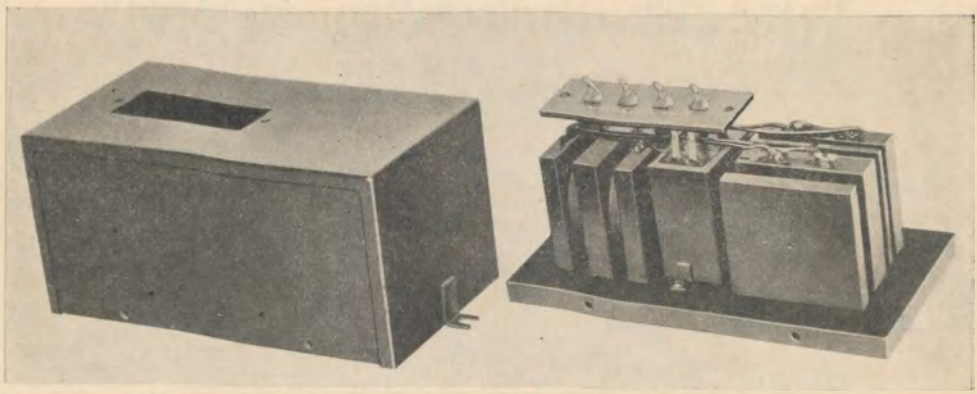


Fig. 3—Multiple-tuned transformer employed in field-strength measuring set

band selectivity, but it still retains the form and the functions of a transformer.

Where maximum amplification is of utmost importance, the capacity for tuning the secondary winding is obtained by utilizing only the effective distributed capacity of this winding plus the effective input capacity of the vacuum tube to which it is connected. The capacity across the primary winding and the coupling between the windings is then proportioned to give the desired quality and band width. More than one transformer is sometimes used to obtain the necessary selectivity. Several may be connected together with either series or shunt condensers to obtain the equivalent of a multi-section bandpass filter. Networks of this type have been employed in place of the usual bandpass filter because of their simplicity, compactness, and relatively low cost. They may be used to connect either two equal or unequal impedances as well as to operate from an impedance directly into the grids of vacuum tubes.

The voltage amplification characteristic of a shielded-grid tube and a transformer having both its primary and secondary windings tuned by capacities, is shown in Figure 1. Such a transformer was used as the coupling circuit between shielded-grid vacuum tubes of a high frequency amplifier. It should be noted that this type of transformer transmits with a high degree of uniformity all voltages between frequencies of 79 and 88 kilocycles while providing a discrimination against voltages ten kilocycles away from the edges of the band

(Continued on Page 22)

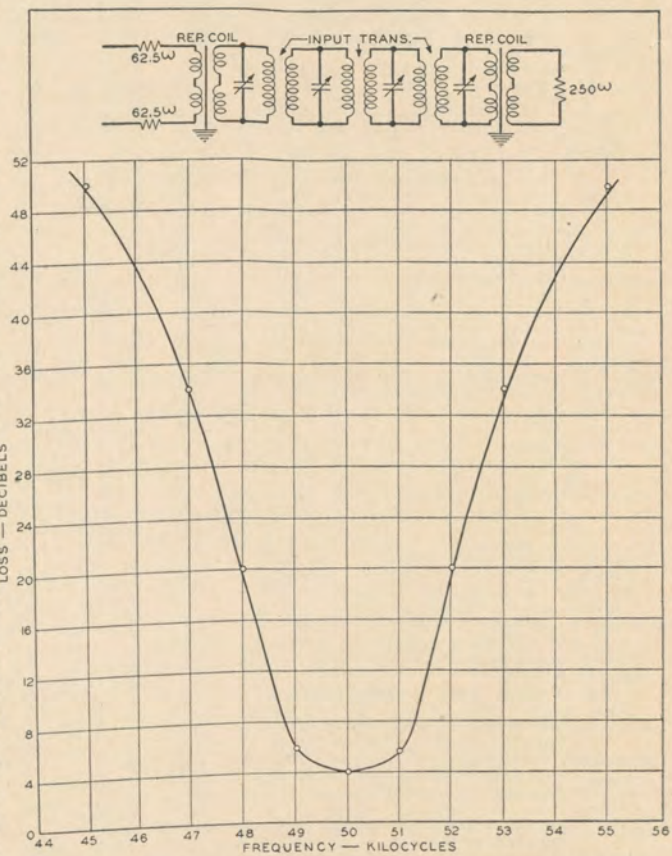


Fig. 4—Transmission characteristic of quadruple-tuned transformer. Circuit schematic above

THE ART OF COPYING BEHIND

By WALTER H. CANDLER

Physical and Mental Training Necessary

Does it not, therefore, stand to reason that since telegraphing is a mental and physical process, we must necessarily train our mind and body to co-ordinate in doing fast, accurate work? I want you to bear in mind as you read this that I am writing just as I would talk to you were you sitting here in my office—as one telegraph operator to another. As a telegraph operator whose record needs no comment, I have a clear understanding of your problems for the very simple reason that I have experienced all of them.

Mental Factor Important

To overlook or ignore the functioning of the mind in telegraphing is a grave error. You telegraph with your mind. The hand that sends and writes is merely a servant of your mind—does as the mind directs. Please understand there is a vast difference between "wishing" and directing. The untrained mind "wishes" while the trained mind directs.

When your hand, for any reason, cannot execute the commands of the mind, the mind frets and worries. Your hand is passive—it does not think, hence it does not worry. It can be trained to co-ordinate with the mind and carry out its commands, but until it has been so trained its capabilities are extremely limited.

The Co-ordinative Principle

Science teaches us that the muscular system is an automatic living mechanism of the most complicated and wonderful kind. Please follow me closely because it will mean much to you to understand what I say. To every muscle arteries carry their vital streams of food and oxygen. The muscle cells select their own diet, and the veins (not the arteries) take away the waste products. Anything that interferes with this process interferes with the Co-ordinative Principle of your body and throws it out of gear. On every muscle there are the fine endings of some nerve which comes directly or indirectly from the spinal cord, and, at the proper moment, a discharge along the nerve causes the whole mass of cells or fibers in the muscle to contract simultaneously and lift the bone to which the muscle is attached. The nerve impulse is slight, merely like the match set to the great energy stored up like powder in the muscle. But when we remember the number of muscles needed for a single harmonious action, 54 are brought into play at each step in walking, and there are about 300 muscles concerned in the complete process of walking, the delicacy of their adjustment, the precise degree of action needed in each, we cannot but marvel at the ceaseless regularity and correctness of this unconscious play of muscle and nerve and nerve center.

Apply This to Telegraphing

Now apply this process to telegraphing—to sending, to receiving and writing with a pen or "mill". How many impulses and muscular responses or "reflexes" do you suppose are necessary in the sending or receiving of one 10 word message, or short market report? Multiply this by one average day's work at your office, then by seven and by the working days of a month and a year.

Every impulse and response consumes a certain amount of VITAL ENERGY. You know the principle of a storage battery. Used without recharging it eventually becomes exhausted. And so with your body. Constant replenishment of nerve and muscular energy is necessary just as a constant carrying off of all waste products (ashes) is necessary. Anything that interferes with the normal functioning of a muscle, especially in the arm of the telegrapher, throws the entire muscular and nervous system out of balance.

Your Mind

Let us glance, for a moment, at the big boss, the regulator, the power behind the throne—your MIND. As previously stated, it has two divisions—Conscious and Sub-Conscious. The Conscious is the director. It wills, desires, prompts and commands, but does not act, except in rare instances—as in learning a new process. When you took up code you first consciously learned the dits and dahs and by constant, conscious repetition, they were impressed on the Sub-Conscious Mind. Not until they were so impressed did you really begin to learn code. This explains the importance of a proper beginning. Not until a radio operator can read code as he does a newspaper can he lay claim to skill.

The skilled operator does not "think" about dits and dahs any more than he thinks of how the words he utters in conversation are spelled. If he did he could not telegraph very much. He who fails to grasp this fundamental principle—how to automatically disengage his conscious mind from his work—can not advance beyond the 10 to 20 wpm. stage and his work is fraught with mental and nervous strain. The old idea that speed is acquired by constant practice is applicable only when such practice is intelligently directed in conformity with this principle; otherwise, years of practice will produce unsatisfactory results. Practice is necessary, but we must know how to practice, what to do and what to not do. It stands to reason that if we actually telegraph with the Sub-Conscious Mind training of a very specific nature must be directed toward this mind and its functioning.

Nervous System and Brain Centers

My sole purpose in writing this article is to give you certain facts gleaned from my many years experience as a telegraph operator and teacher that will be of material benefit to you.

Your nervous system and brain centers may be compared to a postal and telegraph system. For example, certain organs discharge specific chemicals known as harmones into the blood and the blood delivers them to the distant organs which are subsequently set to work. This and all other bodily processes are directed by your Sub-Conscious Mind, which in turn is under the direction (frequently misdirection) of your Conscious Mind. This postal system is too slow for the purposes of ordinary life, hence the telegraphic system is highly developed. Say, for example, you step on a tack. In a fraction of a second a nerve-thrill (message) flashes from your foot to a certain center in your spinal cord, and a return thrill or command causes the muscles of your entire leg to contract, thereby jerking your foot off the tack.

Your body is run by automatic action, better known as reflex, which means action without conscious effort or thought. The messages that

(Continued on Page 30)

Tales of the Old Timer

"DISTRESS"

By WILLARD BLISS

The Young Romantic pushed the newspaper in front of the Old Timer, said, "Look here. Another rescue of a sinking ship's crew. Gee! I certainly would like to be on a sinking ship sometime. That is if I were sure to be rescued."

The Old Timer looked at the Young Romantic disgustedly; the brashness of these young squirts who had never been to sea made him sick, yet one must try and teach a kid something about the sea. With resignation and with what he thought was great forebearance, the Old Timer broke his pre-lunch silence, "So you'd like to be on a sinking ship? But only if you'd be sure of bein' rescued, huh? My Gawd, don't you have any idea of what a ship being in distress means? What do you think such a time is, a picnic? Listen . . . I'll tell you something about a sinking ship . . . .

"If you got any kind of a memory in that dumb head of yours, you'll remember that I was telling you about some trouble we had been having on that little packet and how a sailing ship passed us.

"Well, after she passed us, I turned away from the Captain to go down to the coal pile again, when he stopped me and drew me to one side. He said, 'Don't go down again. You know what's happening?'

"I said, 'No, what?'

" 'We're making water faster all the time,' he said. 'We can't shovel the coal aside to get to the leak in time, I'm afraid, though we'll keep on trying. You go up to your shack and listen in and see if you can get in touch with anyone, any nearby ships. Exchange positions with them but don't tell 'em anything until I say so. Understand?'

" 'Yes, sir,' I said, and went forward.

"As I went forward, I mulled over in my mind what he had said and I said to myself that things were more serious than I had thought. Therefore it was up to me to get that rock crusher of a spark set of mine to going. She was a lulu, that set. An old time Telefunken inductive coupled spark with its secondary coil sliding back and forth on rails from the primary. I had to keep the coil tied down because when the ship pitched it would run up and down and sometimes jump the track. With the loading coils it was topheavy. Everytime the ship would roll, that set would flop over and almost fall off the table.

"There were no batteries and no motor generator on board the ship so that I ran direct off the ship's lone dynamo. When I would start up my set to transmit, an engineer would have to stand by the dynamo valve to throttle it. When I sent a dash he would give it more steam and if I sent dots, less steam. It showed the value of cooperation, anyhow. Because I couldn't have worked if I didn't have an engineer as a sort of an assistant to feed me juice. Nice, hey!

"Before I reached the shack I looked up at my blithering antenna that I had been repairing every day at least once and some days two and three times. There wasn't a yard of it that didn't have a splice in it. Antenna drill was a usual thing for me. And mostly at night, when antennas do break. Just when you're in your bunk and getting to sleep or you are asleep, some one comes along and sings out, 'Break out of it, Sparks. Your bleeding old antenna is loose again.' Nice, hey?

"Well, those were just some of the troubles on that ballyhoo. Why, if I wanted to, I could tell you for a day all the grief that one set can bring a guy, but what the hell's the use.

"I climbed up the ladder to the shack, holding on tight to the handrails as the ship rolled, which was always. Inside the shack was the customary scene. Water swishing around on the deck a foot deep. That ship leaked like she was a sieve. Old age it was. She just seemed to open up and let the water come pouring in. My stool was floating around in the water, as usual.

"I set the stool up and sat down on it, to anchor it. My feet being in the water was nothing. I put the cans on my head and tuned in a fine crystal set. I think that receiver must have been with Noah in the ark. Anyhow, it was antediluvian enough, what with its carborundum detector.

"After fiddling around adjusting it for about ten minutes I found a sensitive spot and heard someone working. It was some blatherskite sending a long CQ. Yes, even in those days they sent 'em long.

"I composed my soul and wet feet in patience and waited for the end of the call for it sounded quite near to me. Finally the guy signed off and I sang out to the mate in the wheelhouse, which was on the other side of the bulkhead from the wireless room, to whistle down below and tell the engineer to give me the steam for my set. At the same time I asked the mate for the position.

"He said, 'A position? How the hell am I going to give you a position. We don't know where we are and haven't known for days.'

"I said, 'Guess then, can't you?'

"He said, 'Yeah, I suppose my guess is as good as anyone else's.'

"The mate looked at the chart while I tapped my key a couple of times to see if the current was coming yet. Finally the juice began to trickle up from down below. The radiation ammeter needle just barely moved. At least I knew I was on the air, so I gave the ship I had heard a call. I gave him another call. Then I gave another call. No use. Here was another ship, not very far away from the strength of his signals, yet I couldn't raise him.

"I got kind of exasperated then, like a fellow does sometimes and I yelled to the mate, 'Hey, you dumb cluck, tell that guy down below to send me up more juice. There ain't enough current in this set to shock a bedbug, if bedbugs could swim.'

"The mate yells back, 'Tell him yourself. And who the hell are you calling a dumb cluck?'

"I jumped up from the stool and ran into the wheelhouse and said, 'You, you silly country-boy.'

(Continued on Page 32)

HIGH FREQUENCY PRESS

(Reprinted from and by Courtesy of Radio Amateur Call Book Magazine)

Note that time given is GMT (Greenwich Mean Time). U. S. Eastern Standard Time PLUS FIVE HOURS = GMT. BB = Major League Baseball Scores. CQ = General call, to all stations. Px = Press News. SX = Stock market quotations. Tx = Time signals. If followed by a number, means only that number quoted. From New York Exchange unless otherwise stated.

Many thanks to operators of KUP, WHD, WNCI, WRH, and others, for their help.

GMT	CALL	KC	METERS	LOCATION		TYPE OF TRANSMISSION
0000	WPN	6515	46.05	Garden City, N. Y.	Px	To WDOL. Robt. Dollar S.S. Co., followed by Sx.
....	WPN	8630	34.76	Garden City, N. Y.		Simultaneously. Daily except Sunday.
....	DAN	11340	26.45	Norddeich, Germany.	Tx	
....	PPE	8720	34.4	Rio de Janeiro, Brazil.	Tx	Until 0030.
0030	WFC	6785	44.22	New Orleans, La.	Wx	Coded Sx 150, followed by Px paid, to KUFC & RXC. Simultaneously with WFB on 90kc (3333m).
0050	DIS	10150	29.557	Nauen, Germany	Px	German & World, in German abrv. Daily except Sunday.
....	DFH	7332	40.918	Nauen, Germany		Simultaneously.
0100	PLO	11440	26.22	Malabar, Java, D. E. I.	Wx	Urgent navigation warnings.
....	KTK	11050	27.15	Mussel Rock, Calif.	Px	CQ—World. Robt. Dollar SS. Co., followed by Sx, BB, plus Pacific previous day. Simultaneously.
....	KTK	8630	34.76	Mussel Rock, Calif.		
....	KTK	6515	46.05	Mussel Rock, Calif.		Simultaneously.
....	SAB	8240	36.4	Goteborg, Sweden.	Px	Swedish press, in Swedish, to SAX and all Swedish ships.
....	WRH	8360	35.89	Carlstadt, N. J.	Px	BB of current date. SX10.
0105	NAA	4015	74.42	Arlington, Va.	Wx	Aviation weather and upper air reports.
0130	NPG	4385	68.41	San Francisco, Calif.	Wx	Aviation weather.
0140	GBR	8240	37.42	Rugby, England.	Px	Paid press to GLSQ. English & World-wide news, races, sports, etc. Simultaneously with GIC.
0145	8ZW	12820	23.4	Shanghai, China.	Wx	and storm signals.
0255	NAA	See remarks		Arlington, Va., U. S. A.	Tx	Until 0300. Simultaneously on 113kc (2653m), 690(435), 4205 (71.34), 8030(37.34), 8410(35.64), 12615(23.78).
....	NPG	12885	23.28	San Francisco, Calif.	Tx	Until 0300.
....	NPO	17744	16.9	Cavite, P. I.	Tx	Until 0300.
....	NPO	8872	33.91	Cavite, P. I.	Tx	Simultaneously.
0300	KUP	6440	46.58	San Francisco, Calif.	Px	CQ—World. Daily except Sundays and holidays.
....	NAA	4205	71.4	Arlington, Va.	Wx	Marine weather.
....	NAA	8410	35.7	Arlington, Va.	Wx	Simultaneously.
....	NPG	4385	68.41	Sanfrancisco, Calif.	Wx	Ship reports, Pacific.
....	NPG	12885	23.28	Sanfrancisco, Calif.	Wx	Simultaneously.
0355	W9XAM	47975	62.53	Elgin, Ill.	Tx	Until 0400.
0356	IRG	5450	55	Massua, Erythrea.	Tx	Until 0400.
0400	KUP	6440	46.58	San Francisco, Calif.	Wx	Repeat on NPG 0330 sked. Daily including holidays.
....	NAA	4015	74.72	Arlington, Va.	Wx	Coded weather broadcast to Europe.
....	VAS	8350	35.93	Louisburg, N. S.	Wx	Canadian Maritime Provinces, followed by Canadian subscription Px.
0415	WSC	6485	46.26	Tuckerton, N. J.	Px	R.C.A. subscription Px. Simultaneously with WGG on 22.1kc (13575m).
0430	NPO	8872	33.81	Cavite, P. I.	Wx	
....	NPO	17744	16.9	Cavite, P. I.	Wx	Simultaneously.
0455	NAA	4015	74.72	Arlington, Va., U. S. A.	Tx	Until 0500.
0518	KUP	6440	46.58	Sanfrancisco, Calif.	Px	Navy Press. 40-45 words per min. copy if desired.
0530	XPI	6520	46.10	Pratas Id., China.	Wx	Asiatic coast weather, typhoons, etc.

AND WEATHER SCHEDULES

GMT	CALL	KC	METERS	LOCATION		TYPE OF TRANSMISSION
0548	WHD	8360	35.89	New York City.	Sx	Until 0600. (0448-0500 during summer time period.)
0600	WHD	8360	35.89	New York City.	Px	CQ—General. New York Times. (0500 during summer time period.)
....	KFS	8370	36.2	Palo Alto, Calif.	Px	CQ—General. KFS, KEK, KOK, traffic list. Simultaneously with 97.5kc (3075m).
....	LGN	8400	35.71	Bergen, Norway.	Px	CQ—in Norwegian, Daily except Sundays.
0700	NSS	8030	37.34	Annapolis, Md.	Px	BB—For naval vessels only.
....	SAB	8240	36.4	Karlsborg, Sweden.	Px	In Swedish, for Swedish ships.
0740	XPN	6250	48	Kamen, China.	Wx	
....	XPZ	6250	48	East Saddle, China.	Wx	
0755	NAA	See remarks		Arlington, Va., U. S. A.	Tx	Until 0800. Simultaneously on 113kc (2653m), 4015(74.72), 8030(37.34), 8410(35.65).
....	NPG	8590	34.92	San Francisco, Calif.	Tx	Until 0800.
0756	FYB	10581	28.35	Paris-Pontoise, France.	Tx	Until 0800.
0845	FVA	9677	31	Alger, Algeria.		
0900	KUP	6440	46.58	San Francisco, Calif.	Px	CQ—General. Daily except Sundays and holidays.
0945	FFZI	10526	28.5	Koukaza, China.	Wx	
1010	GBR	13555	22.132	Rugby, England	Wx	Meteorological report. Daily. Simultaneously with GIC.
1130	FFZI	10526	28.5	Koukaza, China.	Wx	
....	XPI	6520	46.10	Pratas Id., China.	Wx	Asiatic coast weather, typhoons, etc.
1200	GBR	19640	15.275	Rugby, England.	Px	CQ—Foreign office press. Daily except Sundays. Simultaneously with GIC.
1305	NAA	4015	74.72	Arlington, Va.	Wx	Aviation weather and upper air reports.
....	NSS	8030	37.34	Annapolis, Md.	Wx	Simultaneously.
....	NSS	12225	24.5	Annapolis, Md.	Wx	Simultaneously.
1330	WFD	10470	28.65	New Orleans, La.	Px	Paid press to KUFC. Repeat on previous day's ball scores. Simultaneously with WFL.
....	NPG	4385	68.41	San Francisco, Calif.	Wx	Aviation weather.
1355	NPO	8872	33.81	Cavite, P. I.	Tx	Until 1400. Simultaneously with 56kc (5360m).
....	W9XAM	4797.5	62.53	Elgin, Ill.	Tx	Until 1400.
1400	KKB	8630	34.76	Sherwood, Oreg.	Px	Repeat on KTK 0100 schedule.
....	KKB	6515	46.05	Sherwood, Oreg.	Px	Simultaneously.
....	NPO	8872	33.81	Cavite, P. I.	Wx	Weather and hydrographic.
....	XGX	....	34.8	Shanghai, China.	Px	CQ—Robt. Dollar SS. Co.
1430	VAS	12720	23.58	Louisburg, N. S.	Px	Paid, to Canadian National SS. BB plus International & American Assn. Simultaneously with 107kc (2804m).
1500	CLA	9680(?)	31	Habana, Cuba.	Px	CQ—Cuban press in English and occasional Spanish, for 15 minutes. Simultaneously with 333kc (900m).
....	NAA	16820	17.7	Arlington, Va.	Wx	Marine weather, Atlantic.
1530	NPG	4385	68.41	San Francisco, Calif.	Wx	Marine weather and hydrographic.
1555	W9XAM	4797.5	62.53	Elgin, Ill.	Tx	Until 1600.
1600	NAA	16820	17.7	Arlington, Va.	Wx	Coded weather broadcast to Europe.
1655	NAA	See remarks		Arlington, Va., U. S. A.	Tx	Until 1700. Simultaneously on 113kc (2653m), 690(435), 4205 (71.34), 8410(35.65), 12045(24.9), 12615(23.78), 16820(17.8).
....	NPG	12885	23.28	San Francisco, Calif.	Tx	Until 1700.
1700	NPG	12885	23.28	San Francisco, Calif.	Wx	Weather reports.
1730	RXB	73.8	4075	Almirante, Panama.	Wx	Caribbean weather.
....	RXB	11630	25.8	Almirante, Panama.	Wx	ditto on above simultaneously.
1755	W9XAM	4797.5	62.53	Elgin, Ill.	Tx	Until 1800.
1756	IRG	5450	55	Massua, Erythrea.	Tx	Until 1800.
1800	LVA	10130	29.6	Guatemala City.	Tx	

GMT	CALL	KC	METERS	LOCATION		TYPE OF TRANSMISSION
1900	DIS	10150	29.557	Nauen, Germany.	Px	English copyright from Germany, on East-West directional antenna. Daily except Sundays. Simultaneously.
....	DFH	7332	40.918	Nauen, Germany.	Px	
....	FZG	12000	25	Saigon, Fr. Indo-China.	Tx	Until 1905.
....	NPO	8872	33.81	Cavite, P. I.	Px	For naval vessels only.
....	WHD	11355	26.42	New York City.	Sx	CQ—General. New York Times. (1800 during summer time period.)
1955	W9XAM	4795.5	62.53	Elgin, Ill.	Tx	Until 2000.
1956	FYB	10581	28.35	Paris-Pontoise, France.	Tx	Until 2000.
2000	GBR	8640	34.72	Rugby, England	Px	CQ—Foreign office press. Daily. Simultaneously with GIC.
....	CLA	9680(?)	31	Habana, Cuba.	Px	CQ—Cuban press, in English, and occasional Spanish, for 15 minutes. Simultaneously with 333kc (900m).
2030	DIS	10150	29.557	Nauen, Germany.	Px	English copyright from Germany, on North-South antenna.
....	DFH	7332	40.918	Nauen, Germany.	Px	Daily. Simultaneously.
2055	GBR	8640	34.72	Rugby, England.	Wx	CQ—Meteorological report. Daily. Simultaneously with GIC.
....	NAA	16820	17.8	Arlington, Va., U. S. A.	Tx	Until 2100.
2100	KUP	16700	17.964	San Francisco, Calif.	Px	Daily except Sundays and holidays.
....	NPN	4436	67.62	Guam.	Px	For naval vessels only.
....	NPN	13308	22.55	Guam.	Px	Simultaneously.
....	WRH	8360	35.89	Carlstadt, N. J.	Px	CQ—World wide.
2148	GBR	8640	37.42	Rugby, England.	Px	Paid Press in GLSQ. English and world-wide. Simultaneously with GIC.
2150	DIS	10150	29.557	Nauen, Germany.	Px	In German.
....	DFH	7332	40.918	Nauen, Germany.	Px	Simultaneously.
2156	ISG	5450	55 ..	Mogadsicio, It. Somaliland	Tx	Until 2200.
2200	DIS	10150	29.557	Nauen, Germany.	Px	German press, in German, North-South antenna.
....	DFH	7332	40.918	Nauen, Germany.	Px	Simultaneously.
....	LGB	9230	32.5	Bergen, Norway.	Px	CQ—Norwegian press, in Norwegian.
....	W1XAZ	9570	31.35	E. Springfield, Mass.		News by fone broadcast, BB plus International, SX. Between 2145 and 0000, stations used depends upon schedules for that day.
....	W2XAD	15330	19.569	Schenectady, N. Y.		
....	W2XAF	9530	31.4	Schenectady, N. Y.		
....	W8XK	11870	25.27	E. Pittsburgh, Pa.		
2230	ZLW	5700	52.63	Wellington, New Zealand.		Daily except Sundays.
....	EAM	9772	30.72	Aranjuez, Spain.	Px	Paid press, copyright Spain & World, in Spanish.
....	EAV	....	51(?)	Spain.	Px	CQ—In Spanish. Repeat on EAM schedule. (Exact frequency requested.)
2245	LSD	8830	33.97	Monte Grande, Argentina.	Px	In Spanish. Runs to 2315, then ship traffic until time signals at 2345, followed by paid press.
2250	DIS	10105	29.557	Nauen, Germany.	Px	German, sent in Spanish. North-South antenna.
....	DFH	7332	40.918	Nauen, Germany.	Px	Simultaneously.
2300	XPN	6250	48	Kamen, China.	Wx	
....	XPZ	6250	48	East Saddle, China.	Wx	
2330	GBR	8640	34.72	Rugby, England.	Px	CQ—Foreign office press. Daily except Saturdays. Simultaneously with GIC.
2345	LSD	8830	33.97	Monte Grande, Argentina.	Tx	Until 2350.
2350	DIS	10150	29.557	Nauen, Germany.	Px	In English, daily, except Sunday.
....	DFH	7332	40.918	Nauen, Germany.	Px	Simultaneously.
2355	NAA	8030	37.34	Arlington, Va., U.S.A.	Tx	Until 2400.

CORRESPONDENCE SECTION

Dear Editor:

When I was a member of the old M. R. T. A., later named the U. R. T. A., way back in 1918 in the days when a Wireless Operator was a Wireless Operator and not a Ship's Clerk or Errand Boy for the Captain, I always managed to be at least six months ahead of the game with my Association Dues, so I trust I will be able to live up to the same principles now as I did then back in the dear old days of 1918-19-20 and 21; but let me stop at the year of 1921, the time where all went hay-wire as you probably know as well as I do.

Personally, I have no kick coming, considering the hard times, depression and all that goes with it, I have been very fortunate in being able to keep my job and must say that my employers have been treating me royally during the eight years, now going on nine, that I have been with them, and allow me to say that this Company I am working for at present, is still one of the outstanding companies where a Wireless Operator still is considered a Wireless Operator and not a Clerk or Errand Boy for Captains or Officers, provided the operator, himself, lives up to his rank as such and knows how to keep his place on board his ship.

I have been working at my profession since the World War and have lost very little time during my fifteen years' experience as a Wireless Operator, and I can assure you, that it breaks my heart to see and hear how this profession has gone down hill the last few years. I cannot understand why it is that the majority of my colleagues can or will tolerate such conditions as prevail today in many steamship companies, and it is only since I have been acquainted with "CQ" that I have learned of such miserable conditions, especially those that seem to prevail on the Great Lakes where Wireless Operators are doing Sailor's work. What in the name of Harry is the matter with the American Merchant Marine? After reading all of the interesting items in the "CQ" magazines of late, especially those items referring to Legislation Matters, etc., I think it would be a very good step forward if the Association would incorporate a rule or have a law inaugurated, or at least have the matter put before the next Congress, putting a permanent "stop" to compel Radio Operators on board ships of all classes and categories to do clerical work, checking cargo or any other kind of work outside his regular radio duties which his license calls for.

My opinion in these matters is that any Radio Operator, on board ship, who performs such duties, as mentioned above, thereby neglecting his own duties and care and upkeep of his apparatus, is not fit to hold a Radio Operator's license and should have such license revoked immediately, as I consider such a person a menace to our Profession. You have probably heard a good many Operators say: "Well, as long as I am getting ten or fifteen dollars extra per month for doing such work, why shouldn't I grab it?" Maybe so; but when steamship companies today are paying supercargoes or pursers anywhere between $100.00 and $135.00 per month, why should we as professional men be compelled to do the same work for a meagre $10.00 or $15.00 per month? (The Supercargo on board this ship is getting $135.00 per month,—the joke would be on me if I should be compelled to do his work for a meagre $15.00 per month, wouldn't it?)

Next, allow me to voice my opinion in regard to having prospective or future operators serve an apprenticeship on board ships before the issuance of a professional license. I am not in favor of such a plan as it will only lead some steamship companies to attempt to use such apprentices for such other work as some of us Operators are doing now,—such apprentices would make ideal checkers for checking cargo, etc. If an "apprenticeship" on board ship must be served, why not have the plan made as follows: Let any competent Radio School train the student fully in all the branches of Radio Telegraphy, etc., this to include the proper handling of traffic in dispatching messages of various forms also Press Messages, Hydrographic Messages, Distress Messages and so forth, and last but not least, the proper procedure of abstracting such messages. Then, before issuing the license, let the student serve as apprentice on board ship for one trip, or say one month, to see if he is capable of performing such duties commercially and professionally, to see whether he can stand the sea and to see whether he will ever learn to know his proper place and standing on board ship. If the student passes this test, let him then go up for his examination before the Radio Inspectors, next make him a member of the Association and let him fare forth over the bouncing waves with the rest of us. (Who seconds the motion?)

I read with great interest a letter addressed to Mr. Haddock and printed in the Correspondence Section of "CQ", Nov-Dec., 1932, sent in by some Radio Operator who intended to become a member of the Association upon his arrival at Port Arthur, Texas. Said Operator submitted a list of the changes he would like to see made. I approve of these changes myself, except paragraphs number one and three of aforementioned list. Paragraph number one read as follows: "Operators must not be compelled to stay aboard the vessel while in port for the purpose of checking cargo, etc., or do any other work that is really the duty of the mate-on-watch."

I believe it is the duty of the Operator to remain on board his ship certain hours during the day while the ship is in port; not for the purpose of checking cargo or doing other people's work, but for the purpose of being there personally to meet either the Government Radio Inspector, Radio Company's Inspector or Steamship Company Officials who may wish to inspect the Radio-Room and its apparatus. In

(Continued on Page 33)

BROADCAST STATION NEWS

James Lorick, the remote control man at WWNC, says he is willing to put in another six years at the station, having already been there for six.

Cecil Hoskins at WWNC thinks his R. C. A. transmitter is the whiskers. Well, the station carries full NBC program so maybe his boss is satisfied, too. Don't tell the Mrs. things are good, Cecil, or she will be after you to ask for more pay.

R. J. Cowie, chief radio operator at WEEI, is starting on his eighth year with the station. He is an old commercial boat op., but land is good enough for him now.

J. L. Middlebrooks is now chief engineer at WAPI and says "It's not so hard."

F. A. Lange, at WEEI, is another boy who passed up the sea to stay at home.

Jack Provis got himself appointed chief engineer of his station, KID. Well, the KID is good or he would not have made it.

Conway Caine is doing his bit at WWNC. Not that it is anything new, as he has been doing it for three years.

E. B. Janes is finishing his seventh year in broadcast now at WEEI, the first four he was with WEPS and WHDH.

Ralph Painter, control man at WBT, has a voice that just can't be controlled at times. They don't let him near the mike for fear he will shatter it.

The new RCA 1 KW transmitter at WRC, Washington, is doing its stuff nicely.

P. K. Baldwin, who was radio instructor for three years at Eastern Radio Institute, Boston, is doing well at WEEI, but gets the most fun out of his "ham" time at home. L. C. Sigmon, W. H. Rule, J. D. Butrick, and and E. L. Philbrick are some of the other boys at WEEI who also help to jam the air on time off from station.

R. G. Misenheimer has moved from WABC, New York, to WJSV, another Columbia Station at Washington, D. C. Cheer up, R. G., many moves makes light baggage.

Emil Doane is chief engineer of KGNO at Dodge City, Kan.

Tom Hale, at WFBL, Syracuse, N. Y., never gets tired of the game. Has his ham set at home, a transmitter in his Ford, and then goes on the job at WFBL.

Stanley Coker, now with KFUL, Galveston, was formerly with KTLC of Houston, Tex.

John Turrini of WAAT, N. Y. is W2BWK to you after working hours, gents.

G. F. Leydorf, of Ohio State University, has been appointed to the Technical Research Staff of the Crosley Radio Corporation, Cincinnati, Broadcasting Division.

Dick Schenck, of WLW's Technical Staff, recently added a new member to his family. Seven-pound-six-ounces was the boy's weight. Congrats, Dick.

Philip G. Lasky, well known on the West Coast steamer schooners along in 1923, and later on the "President" ships of the 535 class, before Dollar took them over, has been in Salt Lake City since 1927, as director of KDYL.

Fred Crandon is Chief Engineer of WCSH, and also has direct charge of Stations WFEA, and WRDO. That together with a wife and two children keeps Fred pretty busy.

C. M. "Buck" Lewis is Chief Op. at WREN and doing a good job of it.

H. C. Singleton, formerly installation engineer with radio division of United Air Lines, was recently appointed engineer in charge of Technical Department at KGW.

Irving Mower and Sidney Mead are the control room operators at WCSH. Both boys still pound the key at home with their "ham" sets.

Sidney Mead, at WCSH, still carries his "limey" accent we hear having only been in the country three years, so we think he should get in touch with Cyril Fossey at KDYL who in the old days sailed under the John Bull's flag, and still likes to talk about it.

Arthur Bean, who gave up the key on coastwise boats to settle at KGW, still gets up early in the mornings to QSO the little brown brothers in the Orient, we have it on good authority.

Carl Bliesner, Walter Varnum, and Fred Wheeler handle the control room work at WREN.

John M. Baldwin, Chief at KDYL, has R. C. Bruck, an old Navy man, and C. B. (Chuck) Brauer helping him out.

George Sturley, C. M. Carlquist, and O. R. Anderson have rolled up seven years each with KGW. The boys are old ship men who forsook the sea. J. A. Erwin has been at the same station for four years.

Paul Shaad, Alva Frashier, and Verne Omer are at the transmitter of WREN, Kansas may go "dry," but we don't know how the boys stand so you can get them on their off time on the amateur band.

Al Moser spends part of his time at the WCSH transmitter and part at the controls of the station. Roy Maurice is the maintenance man at the station, and Irwin L. Robbins is Assistant Engineer and a good scout, too.

Irving Mower is in the control room at WCHS, which is in the Congress Square Hotel at Portland, Maine.

Polk Purdue, formerly chief engineer of WAPI is now with WHAS, Louisville, Ky.

Charles Frenette, is Chief Operator of CHRC, at Quebec, Canada.

KRKD, Los Angeles, California, have recently changed their transmitter location, and installed a Western Electric 304A.

Station CJOR, Vancouver, B. C., have completely remodeled their equipment. H. B. Seabrook is helping in the work which is still under way.

C. J. Leipert is at WOR, Newark, New Jersey.

Bruce H. Ratts is doing his best at WOWO, Fort Wayne, Indiana.

Pioneer Radio Operators

(Continued from Page 9)

of a small transmitter, drawing its energy from storage battery carried in the baggage car and with properly insulated antenna mounted in links on top of the coaches, and flexibly coupled together when the train was made up, the same as with the air and steam connections. But when it came to the question of which company was to pay for the equipment and installation the railroad economists decided that the proposed wireless service could hardly be self-supporting. And as an advertisement the road had already received a vast amount of world-wide advertising, absolutely free of charge. So why run a chance of exchanging black for red? And there you are. And there, once again, was young, enthusiastic, far-sighted, pioneering Wireless, with another significant history-making, startling success to its credit—left holding the bag—of empty promises.

That was twenty-eight years ago—and even today scarcely a railroad train throughout the entire world is equipped for the unquestionably useful, worth-while wireless communication service which we then, along the banks of the old Mississippi proved to the world was a practicality. And even now, occasionally, we read of the "remarkable demonstration," the "amazing achievement"—of transmitting radio signals to a fast train.

Directly following our demonstrations of the applicability of Wireless to fast travelling express trains for the Chicago and Alton I was called to map out the new installation scheduled for Colorado and points south, Cheyenne, Denver, Colorado Springs, Cripple Creek and Boulder were on the line, and reaching south, to Dallas and Houston, Texas.

As early as April, of that year, 1905, Charley Cooper had opened up the Boulder station, and for Denver had hired Harry Blakeney. His fame as an op. had already gotten back to St. Louis. I found him cracking away at his key among the ruins of the old Grant Smelter on the outskirts of Denver.

Then to my utter amazement I found a single antenna wire reaching up to the dizzy top of the Smelter's brick stack, 300 ft. high, and throwing signals into Pueblo "with looseness." as Mac Horton used to say. And right there for the first time I met Bob Marriott, even then a true veteran of the Wireless, one whose tireless enthusiasm, unflagging devotion, and sterling contributions to the Art and the I. R. E., of which he was the real originator, have earned an undying place in Radio's Hall of Fame.

At Denver also I again met Harry Reynolds, recently from St. Louis and K. C., working steadily higher in the ranks as he worked his way westward.

That night down in the hotel grill, over the steak and some good mugs of ale, I began to compare notes with Marriott, glad to find one who had begun his Wireless as early as had I, among quite similar circumstances, but in different locale. Strange we had never met before. This, as nearly as I can recall, was his absorbing story:

"I became interested in what was written about the wireless work of Loomis and Tesla, first. Then I read about what Marconi did. That was while I was in school in my home town of Richwood, Ohio. Early in 1897, I rode a bicycle 40 miles to Ohio State University and asked them how I could take up the study of Wireless. They said to take their General Science course, specialize in physics and major in Wireless. That is what I did commenceing with the fall term in September 1897 at Ohio State University.

"No other student would study Wireless with me. They did not see any probabilities in Wireless. Therefore I used an automatic transmitter controlled by an old grandfather clock whose pendulum contacted mercury at the middle of the swing and closed a circuit operating the transmitter. The transmitter was in old university hall basement.

"My receiving gear was in boxes that I carried around to various places. I got in bad at one receiving place. I had the receiver on top of the gymnasium tower, with the antenna pulled up by the flag rope above me. Several Pi Beta Phi girls came up to see it. One of the girls who was on the basket ball team and inclined toward athletics took hold of one end of the flag rope and I tried to pull her up. The rope broke and the university was put to the expense of getting a sailor from Cleveland to climb the flag pole and put in a new rope. That put me in worse with some of the university authorities. However I am still in Wireless and the girl will some day be the grandmother of my grandchildren!

"At commencement time in 1901 I took a job with the American Wireless Telephone and Telegraph Company in Philadelphia. Harry Shoemaker was chief engineer. Greenleaf Picard, Midgley and I were assistants. In that work I was chiefly occupied with the construction and operation of a station at the mouth of the Manasquan River and another at Barnegat in New Jersey. However during the Yacht Race time, 1903, I was around the Galilee station where Picard held forth, and around your station not far from Galilee and Marconi's station at Heights of Navsiuls. I probably was around where you were but did not know you by sight. Rodebaugh was one of the operators about that time and I believe he now lives in Philadelphia.

"In the fall of 1901 I came here to Denver and then designed and superintended the building of the apparatus for the Catalina to Mainland circuit. In the Spring of 1902 I supervised the building of the stations on the hill above Sugar Leaf at Avalon, Catalina Island, and at Whites Point on the mainland, near San Pedro. In the summer of 1902 I sent the first message across from Catalina and received the answer. A man by the name of Carrol was the operator at the White Point end. He could handle coherer type messages that he had learned a short time before while working for the English Marconi Company. However the system I designed used rewound Stromberg-Carlson headphones and a detector of steel and oxide of iron. Therefore he was not much better at sound reception than I was. And wire line operators were not much better either, they could read the click of a sounder by ear but the buzz or sputter we got in the head phones was unintelligible at first.

"Many people thought we were falsing our wireless at Catalina. We reported the Jefferies-Fitzsimmons fight to the people of Avalon but still they did not believe us. They would admit we were clever but they doubted our honesty.

"A few days later just before the early boat left Avalon, the Metropole Hotel was robbed and the thieves got away on the early boat. The Banning brothers who owned the island and hotel routed us out of bed. We sent a message to San Pedro which was connected to White Point by Western Union wire. The sheriff met the thieves when the boat docked. The thieves and many others were amazed. The thieves,

(Continued on Page 27)

Tuned-Transformer Coupling Circuits

(Continued from Page 13)

corresponding to approximately 14 decibels. This combination of a relatively wide and uniform transmission band and good selectivity is impossible of attainment with the single tuned transformer previously employed. Furthermore, by utilizing the effective electrode capacities and effective winding capacities for the tuning condensers illustrated in the circuit schematic as C_1 and C_2 the above characteristic is obtained with low cost and high efficiency; the voltage amplification shown over the band being practically equal to the amplification factor of the tube. A similar transformer is used in the last stage of the intermediate frequency amplifier of the 4-D Radio receiver, used for monitoring broadcasting transmitters. To obtain maximum voltage amplification with this arrangement, the grid capacity of the detector and the distributed capacity of the secondary winding act as the tuning condenser for the secondary winding while an external condenser is placed in parallel with the primary winding.

The addition of transformer windings and condensers to the above type of structure is analogous to the addition of filter sections to the usual type of band-pass filter; the effect is principally greater frequency discrimination. Figure 3 shows the mechanical arrangement of the transformer and condenser elements of a coupling circuit in which more than two transformer windings and two condensers are used. Here two independent transformers are electrically connected through a series condenser. The transmission characteristic and circuit schematic are shown in Figure 2. This device is equivalent from a transmission standpoint to a confluent section of a band-pass filter. This design is used in the intermediate frequency amplifier of the 44A Test Set, used to measure field strengths of radio broadcasting stations. It can also be used successfully in the intermediate frequency amplifier of a superheterodyne radio receiving set. Better performance is obtained when operating a network of this type into a detector tube of the plate-rectification type than into a detector tube of the grid-leak type or into an ordinary amplifier tube. The lower input capacitance and conductance of the former type of detector tube will permit the cut-off frequencies to be located quite close to the extremities of the transmission band, which results in greater selectivity for an allowable variation in transmission over the band.

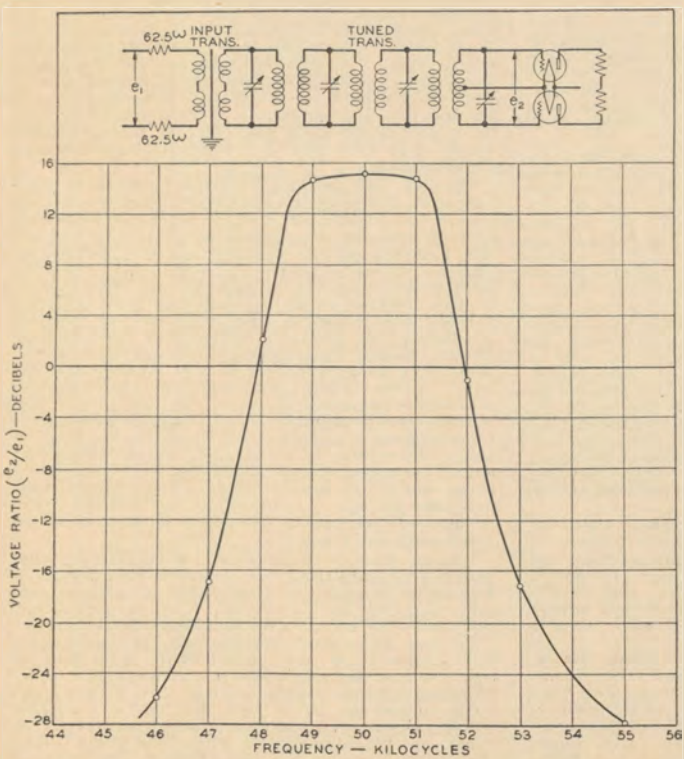


Fig. 5—Transmission loss characteristic of quadruple-tuned transformer. Circuit schematic above

The effect from a transmission standpoint of electrically connecting the three independent transformers with condensers is shown in Figures 4 and 5. The condensers shown in the schematics are added externally and their capacities may be adjusted to locate the transmitted band anywhere between 50 and 150 kilocycles. This particular arrangement is used in power-line carrier-telephone systems to eliminate interference caused by other carrier systems on the same power circuit. As shown by the transmission characteristics, this type of structure will operate efficiently between finite impedances or between a finite impedance and the grid circuits of vacuum tubes.

Transformer coupling circuits of the general types described above are becoming of more importance in carrier and radio development where it is desirable to obtain uniformly high transmission efficiency over relatively narrow bands, and, at the same time, high attenuation outside the desired band. Their use is not necessarily limited to the frequency bands illustrated but may be extended to higher frequencies with satisfactory results.

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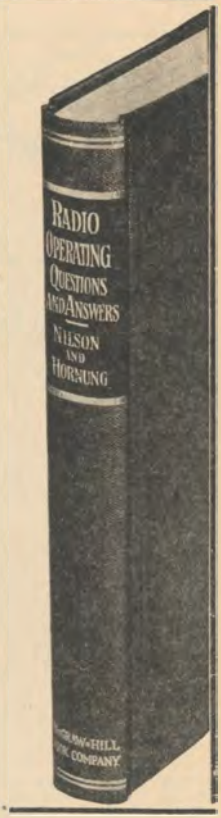

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American Radio Telegraphists Association News

All communications for The American Radio Telegraphists Association should be addressed to James J. Delaney, secretary-treasurer of the association, 20 Irving Place, New York City.

Authorized representatives are as follows:

Boston, Richard J. Golden; Charles W. Marsh.
Baltimore, Christopher Kelley, 650 West Fayette Street.
Miami, D. W. Scott, P. O. Box 2254
New Orleans, Forrest H. Flanders, Y. M. C. A., Box 314, 936 St. Charles at Lee Circle
Great Lakes, Arthur H. Freitag
Fort Arthur, (Gulf representative), Hoyt S. Haddock
Baytown, Texas, Ralph E. Knudsen
Beaumont, Clyde B. Trevey
Seattle, Rollie B. Weiss
San Francisco, Oliver Treadway
Los Angeles, M. L. Schaefer

A letter from the Secretary-Treasurer follows:

Effective with the election of a President which occurs at about the date this issue comes from the press, the Secretary-Treasurer offers his resignation, effective as soon as it is possible for the President to assume his duties.

This should not concern the organization in any way. An editorial committee is being formed headed no doubt by Mr. Willard Bliss, who will hereafter assume the duties of preparing this material for the magazine. The President will take over the duties of Secretary-Treasurer. Mr. Bliss is known for his articles in this and past issues entitled "Tales of the Old Timer." Able, efficient and with a deal of self assurance.

Operators generally are of a very high strung temperamental nature, need the guidance of a strong type who can understand and sympathize with the needs of the great body and it is a certainty that the one elected will be of this calibre. The leaders in the race are all able men.

My reasons for resignation do not for an instant presuppose a failure of the A. R. T. A. We are a self supporting organization, founded on practically nothing but the crying need of such an institution and the confidence of the men who believed in the integrity of its leaders. I ask all the members to support the new regime without reservation and I pledge my unflagging zeal as a member, and one who has been a founder and most interested in the development of the Association, that in case of future need I shall devote all or part of my time, as necessary to lift it out of any pitfall it might encounter in its progress.

New York Notes

Herbert Martin seems to be standing by the Dixie Arrow with great satisfaction.

Roy H. Roberson left his Tracy boat and is now on the beach here again, dividing his time between heckling the Secretary and hospitalization. And don't get us wrong, Bro, Roberson is one of the best.

Steve Kovacs is hanging by the Beaconlight so long we feel he must have more than an operator's interest in the Standard Shipping. That Antenna Current article of last month shows he must have been doing more with his spare time than writing to the girl in Baytown.

Jesse Copeland, I almost said Crawford, was relieved in the Boxbar by our old friend J. Crosby Anderson. J. C. caught another ship out of Boston.

Joe Gately has been doing unprecedented time in the Empire Arrow. Joe must like the ship.

Bill Kirchoff happened to make the greater portion of the trip inter-coastal at time of going to press. Bill, you will remember, ran afoul of a bar off Portland, Ore., on his last trip out in the Sheppard line. This time he is trying it in the Wind Rush.

Joe Perlman relieved Pop Murray in the Fairfield for a trip and is now a resident of the Lynmore—in other words back on the beach.

Willard Bliss has been here with us for a month or so and ably acting as Temporary Chairman at the weekly meetings. James J. Flaharty is operating as his very competent aide.

Regardless of the Secretary's announcement of his intention to resign this month, have no fear of the ultimate success of the A. R. T. A. as it is assured of being in much more capable hands. More pep, new blood, etc., which is so necessary in an organization that must earn and merit success.

Our good friend and patron, J. C. Lindenmayer, having given us quarters rent free for nearly a year has found it necessary due to the lack of patronage by our brothers while ashore to charge us a moderate sum for occupation of the space. This can be brought to naught by the support that he is so much deserving of by stopping at the Lynmore while in port. Right is right. Let's do a little better by the people who have so heartily been behind us.

Residents of the Lynmore, our headquarters, now include Delaney, V. W. Minzey, Joe Perlman, Fred Lambert, Bob Merrill, unemployed for more than ten months, has eventually shipped out. Congrats, Bob.

McCallum, hero of the DeBardeleben, paid us a visit lately. He is now with Standard Shipping.

The Washington, newest of the U. S. Liners to take her trials this month, will go out with W. D. Thomas as Chief. Just a whisper, one of the juniors is liable to be the present Chief of the Exechorda.

Tony, whom most of the boys know from his function as host extraordinary at 78 Third Ave., The Favordale, recently took a front room at the Lynmore. Salutations, Mr. Maggi.

We learn that Charlie Porter was once again relieved as Junior in the George Washington.

American Radio Telegraphists Association News

Too bad some of our boys who are more physically fit should not have to make the sacrifices. Charlie, as most know, is almost blind.

"Doc" Forsyth, on the beach for ages since his last assignment with the Standard Trust, has had two operations on his eyes. "Doc" was recently turned down for admittance to Snug Harbor.

West Coast Notes

The bank holiday messed things up, tankers and coasters out here paid off in checks which would not be cashed.

The SS Wind Rush pulled into L. A. and left for the East with a deckload of 16 ft. lumber.

Have the boys noted where amateurs are now permitted to work experimental stations which formerly required a commercial license, well anyway that is the way it seems to read. Soon they will be on ships too.

The N. B. C. gang in S. F. all read "CQ" and think it is good.

Frank Barron after pounding brass for years drifted ashore to Western Air, then police radio, and now with N. B. C. in S. F.

Ships hearing a loud roar and more 600 meter QRM will find it is only KPO using his new 50 KW outfit.

RMCA Seattle have outfitted completely the radioroom of the Dellwood, getting ready for Alaska fishing season.

KFS putting in new station near Half Moon Bay south of S. F.

New rates in effect on West Coast get sked from Mackay, Wn. Ore., Nev. & Cal. 21c a wd.

Radio Beacon on Farallon under construction.

Bill Kirchoff is doing the West Coast on the Wind Rush, and was here in Seattle Feb. 23rd.

We may open headquarters out here at the Palace Hotel, 1st and Madison, Seattle, Wash. It's only a block from Mackay and RCA Offices.

Walter Tease is in Portland waiting for some of the Alaska SS Co. boats to go into service.

Ralph Golnik finished up at the Dollar Station at Edmonds, and is on the Tacoma-Oriental freighter Olympia now.

The Dollar outfit in Frisco laid off five men at Musselrock.

Sanderson who has been Mackay Manager in Seattle for the last few years has retired. The new manager is Stoval.

Harry Kline is on the beach at Seattle.

Hastings Goodrich is on the "SS Arizonian."

W. K. Lister is on the "Maliko."

Wheeler is pounding on the "Dorothy Alexander."

R. M. Hansen came into port on the "Ohioan."

Gulf Notes

Roy Richards, SS West Chetala, contracted flu on his return voyage from Europe. As a final blow the malady settled in Richard's ears rendering him practically deaf. He is now confined to the marine hospital, Galveston, where we hope to see him make a speedy recovery.

Roy Miller is again among the list of sea-going operators. Roy has been on the Miami-Port Arthur run for sometime but is now assigned to the West Chetala, making European ports.

E. A. Bourgeois, Tug Bafshe, has acquired the studious bug, and has apparently spread it to the other Sabtoco vessels.

Again the SS Harverster is the place of a mysterious accident, making the total three for that vessel. This time the Chief Mate was found in his room with a bullet wound through his head. The Operator, Burt Harmon, advises that the detectives in charge gave out suicide as the cause. The wound brought immediate death and the automatic used was not to be found in the closed stateroom.

Geo. De Mude, Cities Service Ohio, took a trip to Lake Charles, Louisiana, while his ship was docked at Port Arthur, to enter the realm of matrimony. Congratulations, De Mude.

McKinley Rhodes has been permanently assigned to the Gulftrade after making three relief trips on the vessel.

J. H. Livingston is back with the Velma Lykes again after taking a trip to have his tonsils removed. We hope the operation relieves your throat trouble, OM.

R. H. Cummings, SS H. C. Folger, honored us with a full day's visit this voyage.

C. F. Barclay has left the Gulflight to take up duties with the Airways. He is assigned to the Government base at Fort Worth, Texas. BC, how about some airway dope? And incidentally being a government employee doesn't mean that you have to drop out of our Association.

William Jennings Bryan has been assigned to the Gulflight. Bryan was formerly employed at Beaumont, KFDM.

R. C Harper has interrupted a long stay on the beach for a trip on the Tug Senator Bailey

RCA Representative Gets Navy Post

Colonel Henry Latrobe Roosevelt, who since 1920, has been European representative of the Radio Corporation of America, was called into service as Assistant Secretary of Navy by President Roosevelt.

* * *

President Roosevelt, himself, was Assistant Secretary of Navy at the time of the formation of the Radio Corporation of America. The present Assistant Secretary of the Navy is a distant cousin of the President.

Short Course Planned

The Radio Department of the University of Wisconsin Extension Division are to give from April 10th to 12th inclusive a short course in radio.

Topics will cover new sets, new circuits, new tubes, testing equipment, interference, automobile radio, and amateur transmission and reception on ultra-short waves. Specialists from leading manufacturing firms will be called on for lectures. Registration fee is $1.00 which entitles the registrant to all lectures.

Veteran Wireless Operators Association News

(Note: All communications to the V. W. O. A. should be addressed to WILLIAM J. McGONIGLE, SEC'Y, 140 VANDERBILT AVE., BROOKLYN, N. Y.)

Tribute on Memorial Day

The May 1932 issue of CQ carried the following article on the editorial page: "The Veteran Wireless Operators Association has sponsored a move to observe a silent period of one minute on Memorial Day, in memory of the operators who have lost their lives at sea. The radio communication companies, Army, Navy and Coast Guard authorities are expected to favor the suggestion. It is proposed that all radio communication cease for one minute immediately after the noon time signals, P. S. T. for the Pacific, and E. S. T. for the Atlantic. Marine and coast station operators are requested to ask foreign ships in American waters to remain off the air during the period we are paying homage to our dead."

The Veteran Wireless Operators Association will again, this year, sponsor the one minute silent period; a tribute to the heroic operators who went down with their ships. All communication companies, as well as the government services, will be requested to co-operate.

Monument to Wireless Operators

Memorial services will be held at the Wireless Operators Monument in Battery Park on Memorial Day under the auspices of the Veteran Wireless Operators Association. The names of operators who have made the "supreme sacrifice" during the past two years will be placed on the monument previous to May 30th. Anyone knowing of a case where the radio operator lost his life in the performance of his duty, is requested to forward the information to the V. W. O. A. headquarters.

V. W. O. A. Year Book

A complete list of the Awards, Gold Medal and Testimonial Scroll, is contained in the 1932 Year Book and 1933 Year Book Supplement, a copy of which can be obtained for $.50 from the Secretary. A wealth of descriptive matter concerning the activities of the Association during the past few years is also incorporated in these books.

Meritorious work on the part of radio operators should be made known to this Association so that recognition may be tendered. We will appreciate co-operation in this matter from all radio operators.

The V. W. O. A. at the World's Fair

A display, incorporating a replica of the Wireless Operators Monument, as well as two of the Gold Medals awarded by this Association and a Testimonial Scroll, will be set up and attended by Mr. George H. Clark, Director of this Association. The radiomen of Chicago and other midwest cities are urged to visit Mr. Clark who will be pleased to tell them of the aims and activities of our organization.

The Board of Directors will tender Mr. Clark a Testimonial Dinner prior to his departure for Chicago. This is a well deserved tribute to one of the most active men in the Association. We all join in wishing Mr. Clark "Bon Voyage" (or whatever it is that you wish one who is boarding a train for a trip).

Will You Be There?

The Veteran Wireless Operators Association will sponsor an informal get-together, which will probably take place some time during the month of May. Those who attended a similar affair held last June will, we believe, agree that a good time was had by all. Recent national legislation will make it possible to have just the type of beverage so popular at all affairs where "good fellows" get together. Inquiries regarding this affair are invited. Further information will be included in the next issue of this magazine. A definite date and place will be decided upon before that time.

Personal Mention

Ray Meyers, recipient of the Association Gold Medal for 1932, is in Philadelphia Naval Hospital where he will shortly undergo an operation for mastoid. Cheerio! Ray, and hurry out of there. The Association sends best wishes for a speedy termination to your confinement . . . A. F. Wallis, Director, enjoyed his trip on the Munargo immensely. He returned to N. Y. nicely tanned . . . V. H. C. Eberlin, Treasurer, "pounded brass" at WBF for two weeks recently. We heard no complaints regarding his "fist" so he must still come up to TRT standards. Ebby was the man who greeted you when you presented your ticket at our recent banquet. He did an excellent job there, too . . . Gordon B. Rabbitts, who radio operated with Marconi in Newfoundland when that memorable "S" was first transmitted across the Atlantic, was nominated by the writer for membership in our 50 year group. Hearing no arguments to the contrary GB becomes the "Charter" member of this group . . . Harry Chetham, who from his service record, seems to have had more experience in radio operating than any six of us, also qualifies for membership in the 30 year group. "Beat this Record"—Excerpts from service record of Harry Chetham: Served on more than 70 merchant ships in addition to 12 naval vessels; worked at and helped install first broadcast station in U. S.; made world's long distance record——WBF Boston, Marconi station, December 21, 1912, to Pacific Mail Steamer Mongolia off Nagasaki, Japan (8000 miles) with a 2 KW spark transmitter; held First and Extra First Class Commercial Licenses continuously since 1911 and a Certificate of Skill previous to the first issue of Licenses; worked with radio instruments as far back as 1898; SOME RECORD! . . . We received a pleasant surprise in the form of a letter from George Street, the whereabouts of whom we asked recently. He is living in Oakland, California. George certainly has a host of friends as we received at least half a dozen replies to our query concerning him. Good luck, George . . . Want to buy a Ford car? If so, see Peter Podell, a Charter member of this Association, who is now connected with the Caswell Motor Company, of 651 West 125th St. He will give you a square deal. Sends 73 to all . . . Daniel J. De Coste of the Boston office of Radiomarine sends greetings to all. Dan is a real "OLDTIMER." Started in radio operating in 1909 . . . "Doc" Forsyth gets a '33 card. How have you been, "Doc"? . . . Upon receipt of $2.00 (annual dues in this Association) Ye Secretary will be pleased to mail you a '33 card . . . E. H. Reitzke and Clayton Williams of Capitol Radio Engineering Institute are both veteran members . . . Josef Israels and Robert B. Stewart are new members since last issue . . .

LOOK FOR ANNOUNCEMENTS OF OUR GET-TOGETHER IN THE NEXT ISSUE OF CQ!! YOU ARE CORDIALLY INVITED TO BE WITH US ON THIS EVENING.

Pioneer Radio Operators

(Continued from Page 21)

two colored men, proved we were not falsing our wireless."

Incidentally that Catalina to the Mainland communication remained a wireless circuit for 21 years, until the telephone company substituted two cables for it.

"What did you do next, Marriott, until we grabbed you and sent you out here?" I queried.

"Well, I worked on some wireless patents in Washington, D. C.; built some wireless apparatus with the Carstarphen Electric Co., in Denver and the Ashley Wireless Telephone Co., of Chicago, and did some work on deForest transmitters for a guy, Witherspoon, who had brought them here to Denver, and then for the American deForest. I own a half interest in a partnership called the Denvel-Electrical Laboratory.

"That chap Blakeney you met today out at the Smelter is one of the best operators I ever knew, he has operated every way. When he was so drunk they had to lead him to his table he could handle more wire line Phillips code than any other operator in the fast Denver newspaper service. They said he always sends perfect Morse. It is fine when it is slow but when he speeds it up it is only a hum to me.

"Your manager in New York recently sent an operator by the name of Penn out here to Denver from Boston. Penn is one of those kind who thinks that everybody who lives west of where they come from is very inferior and he was characteristically mean about it. A few weeks ago when I was on top of that 352 foot smelter chimney untangling the antenna he operated the transmitter to see what I would do. I sat up there on an iron plate about three feet wide with sparks jumping all around me

(Continued on Page 31)

A Modern Shipboard Transmitter

(Continued from Page 11)

A complete installation for operation from alternating current, consists of:

Transmitter.
Operator's control unit.
Auto transformer.
Rectifier for relays.
Key.

The transmitter is assembled on a strong copper plated angle iron frame. The front panel is made of aluminum with a black wrinkle finish. The sides and back are completely enclosed with perforated copper plated sheet iron, and the top is also completely enclosed. The frame is divided by shields into separate compartments for the master oscillator, power amplifier and antenna circuits. Tube access doors are provided on the front panel. These doors are fitted with interlocks, which automatically open the high voltage circuits whenever the doors are opened, protecting the operating personnel from accidental contact with parts carrying high voltage.

The parts comprising the rectifier are mounted in the lower part of the transmitter frame. This section of the frame also contains the various contactors, time delay relay, etc., and the terminal board for connecting external wiring which is accessible from the front. Immediately above the rectifier are the high frequency circuits followed by the tubes with the intermediate frequency circuits at the top.

The complete transmitter assembly is mounted on four semi-elliptical springs at the base. Four screw eyes are provided on the top to which spiral springs and turnbuckles may be attached and fastened to the deck head to minimize side sway.

Mounted on the front panel are the following:

INSTRUMENTS:

Plate voltmeter.
Filament voltmeter.
Plate ammeter.
Antenna ammeter.

CONTROLS:

IF master oscillator power amplifier tuning control.
IF antenna tuning control.
Antenna transfer switch.
Test button.
CW-ICW switch.
HF master oscillator tuning control.
HF power amplifier tuning control.
Antenna coupling control.
Range selector switch.
Plate power control.
HF-IF band transfer switch.
Filament voltage control.
Overload relay reset button.

Provision is made for using one large antenna for both IF and HF transmission or a separate antenna can be used for each frequency band as desired. There is a relay for breakin reception when working in the 375-500 kc. band and a send-receive relay controlled from the operator's table for the high frequency band. Breakin reception in the high frequency band is obtained if desired, by using a separate receiving antenna. All component parts are of substantial construction and so mounted as to be readily accessible for inspection and repairs. Every part used in this transmitter has been designed both mechanically and electrically to give reliable service under marine conditions.

The rotary converter is a two-bearing machine of such dimensions that it can be readily installed in the radio room or some suitable location outside the radio room, if desired, such as a nearby electric station or the engine room. This machine is built on a frame of standard marine design insuring satisfactory operation aboard ship. It is equipped with ball bearings. This machine, when connected to a 110 volt D. C. line, delivers three phase, 60 cycle A. C. at approximately 70 volts to the primaries of the plate and filament transformers. It draws approximately 25 amperes from the line at 110 volts when the transmitter is operated at full power and approximately 6 amperes with no load.

A small operator's control unit is supplied for mounting on the operating table. It contains two push button switches, one for starting and stopping the rotary converter and the other for remotely controlling the high frequency send-receive switch.

The automatic starter for the rotary converter is a separate unit, which can be mounted in any convenient place close to the rotary converter.

Overall dimensions of all units have been kept within limits which will permit of passing through the usual cabin door.

New York Police Report

Police Commissioner Mulrooney of the New York Police Department made public the results of the Radio Division of the department, which installation cost $100,000. Radio Patrol cars made 18,344 runs, recovered $260,911.00 worth of property, and made 1,408 arrests.

A GOOD KINK

When President Roosevelt was inaugurated Cyril Fossey of KDYL's control room "canned" the inaugural address on 33 1/3 rpm. disks. Later that night the transcriptions were played for the benefit of listeners who couldn't tune in earlier in the day; the stunt made a big hit with the public.

Transmission-Line Antenna

(Continued from Page 7)

vertical antenna, and are provided with complete shielding to preclude the possibility of stray radiation. The transmission lines consist of special low loss 2-conductor 5000 volt cable with a lead sheath and non-magnetic armor cover and are buried about 18 inches below the ground surface. The armor provides mechanical protection.

The transmitting set and goniometer are the same as used with the loop type antenna. A change is made, however, with the addition of means for transferring the radio frequency power from the rotor windings of the goniometer to the transmission lines. (With the loop transmitting antenna system each rotor winding is connected directly to one of the two loop antennas.) Each rotor winding is connected in series comprising (in addition to the rotor) two fixed condensers, two variable inductors, and the primary winding of a radio frequency coupling transformer. The secondary winding of this transformer is connected to the input terminals of a pair of transmission lines. The series rotor circuits are tuned to the radio frequency of the transmitting set and in conjunction with the radio frequency transformers: (a) To transfer power from the rotor windings to the transmission lines, and (b) to match the impedance of each rotor winding to the impedance of two transmission lines in parallel. For each pair of transmission lines the connections of one transmission line to the radio frequency transformer are reversed with respect to the connections for the other transmission line. This insures that the currents in vertical antennas of a pair flow in opposite directions.

With the T-L antenna system it is not necessary to provide the central open-type antenna required with the loop antennas. Varying the time-phase angle between the currents in the two vertical antennas of each or both pairs accomplishes the same result. When the time-phase angle is 180 degrees, a true figure-of-eight pattern is obtained; when it is 180 degrees minus the space-phase difference between the two vertical antennas, a heart shaped pattern or cardioid is obtained. To control the time-phase angle between the currents in the two antennas of a given pair, it is only necessary to vary the length of the line by inserting the proper length or artificial line in each of the transmission lines feeding the two antennas.

Since the time-phase angle has such an important effect upon the location of the beacon courses in space, it is necessary to provide special means for phase measurement. To check the phase for a given pair of antennas, the voltage is removed from the second pair of antennas, and a milliammeter inserted in one of these antennas. This antenna being equidistant from the pair of antennas under test, the current induced in it from the pair depends upon the time-phase angle between the currents in the two antennas of the pair. For 180 degrees phase angle, the induced current is zero; the greater the departure from 180 degrees, the greater the induced current. The milliammeter reading this current may therefore be calibrated directly in phase angle. Several arrangements are available for bringing this reading into the beacon station so that, if needed, the required adjustment of the phase-control equipment may be made directly.

The Art of Copying Behind

(Continued from Page 14)

go to the brain or spine are automatically "reflected" along a different "wire" (nerve) to the muscles or glands.

Telegraphing becomes, when you have learned it properly by definitely training your mind, nerves and muscles to work together automatically, a reflex action—like jerking your foot off the tack. You cannot acquire this facility accidentally, you must learn to do it just as you learn to talk, read, write, swim, ride a bicycle, drive an automobile and practically everything you do. I repeat, the skilled radio operator does not "think" consciously of his telegraphing in the sense of counting dits and dahs, spelling out words and writing them down. He does not work unconsciously, mind you, but Sub-Consciously, hence he works easily, smoothly and rapidly with the minimum amount of effort.

Reflex—Skill

Just as soon as you have to "stop and think" consciously, you become confused and your speed is proportionately interferred with. Suppose, when you step on a tack you had to "stop to think" and finally when you came to a decision that you had stepped on a tack or something sharp, you would remove your foot. Compare your speed, or lack of it, following that process with that of the reflex process. The same difference is applicable to telegraphing.

The skilled boxer dodges a dangerous blow without stopping to "think." If he depended upon intellection, his handlers soon would be carrying him out on a stretcher. Jack Dempsey says when he goes into the ring he leaves his "thinking" outside—that he fights automatically. Until a fighter has been systematically trained to do that he should stay out of the ring, and the same applies to telegraphers. To do skilled work easily, smoothly and rapidly, like a well oiled, regulated machine, the telegraph operator must be trained to work automatically. He must know how to use his mind, how to control his nerves and muscles automatically and direct his mental impulses.

Brief Code Analysis

Space necessarily prohibits a complete analysis of all code signals, but I want to give you enough to illustrate one of the grave errors heedlessly indulged in by certain would-be instructors who formulate courses and manuals of code instruction. In doing this I shall follow their method literally, by allowing the space of one dit between parts of letters.

..."I tsealste twntit emiaiai etmeaeee emiteeeette"

That looks and sounds rather disorganized, does it not? If you have spent any time on the air listening to the transmissions of self-taught amateurs or those who have taken such code courses, you ought to be sufficiently familiar with such a hodgepodge to translate it into readable English, as it should have appeared in properly transmitted code, thus:

"I believe you will agree with me."

Work it out for yourself, leaving the space of one dit between parts of all signals.

Can any radio operator copy such a conglomeration at any distance behind?

Occasionally you will encounter a ham who has learned to not permit any space between parts of signals, and because of a certain prejudice, he overdoes a good thing by going to extremes. He sends the same sentence thus:

"Ihe llevey ouw lllagre ewi thme."

Hour after hour he will pound and pound, unable to understand why others cannot read his "perfect stuff."

No operator can copy such stuff behind. It must be "picked out" and guessed at.

Now tune in on some of the commercial bands and observe the difference. Many hams do not like commercial bands because the sending is contrary to what they have been taught; and, too, one will encounter occasionally inaccurate transmissions on commercial bands for the reason that many commercial operators are recently recruited from the amateur ranks. But you will find that the transmissions from WNU and KUP are, as a rule, superior to the ordinary run of sending, and many hams are obtaining excellent practice by copying them.

Proper Impressions

It is difficult, often impossible for a skilled operator to copy behind when trying to "pick out" the hodgepodge of a poorly trained sender. Therefore, it will be quite obvious that the first requisite in learning to copy behind is to contact a sender whose sense of proportions is well balanced, whose timing is consistent and whose speed is regular. You may "pick" sense from some of the others, but practice with them will not in any way promote your skill. Unconsciously, you will fall into their bad habits.

Some hams have no desire whatsoever to improve their sending. They work on the theory that so long as they can make a noise with their key or "bug" that they are sending good stuff and others ought to be able to read them. Such fellows make ham practice very unpleasant, and do, perhaps unintentionally, much toward disrupting what otherwise ought to be one of the most fascinating pastimes, and furthermore, they retard the progress of those conscientious, serious-minded fellows whose ambition is to improve their skill and raise the standards of Amateur Radio.

You will agree with me then that a child must learn to walk before he can learn to run, and that the ham must learn to send properly formed, spaced and timed signals before he can hope to acquire speed; that is, readable speed. Many hams have speed but it is unreadable, therefore, useless. The faster a ham can send poorly timed stuff the more difficult will it be for him to break the old habit and learn to transmit properly.

Many deluded hams believe that because others are unable to make sense out of their conglomeration of dits and dahs, they are fast for the average receiver to interpret. Those in their assumption. Anything they send is too sending too fast. In a sense they are correct of you who roam around through the ether every day and night realize that I do not exaggerate.

Copying Behind

After a child has learned to walk easily, steadily—without stumbling and falling over the smallest obstacle—he can readily learn how to run. When a code student is familiar with the necessary fundamentals, has formed the right impression of all the signals and transmits them easily, steadily, smoothly as he talks or reads, he can easily develop speed; as a matter of fact, speed will come as a natural result. When, through the systematic development of "sound consciousness" he can read signals as he reads a newspaper or listens to some one talk, without having to "think" of the number of dits and dahs, he can begin to acquire the habit of copying behind.

All code students first learn to "copy close." They consequently form the "letter-by-letter" habit which necessarily must be broken. The only way to break a habit is by supplanting it with another which you KNOW to be superior. This requires intelligent training.

Copying behind is not difficult after you have succeeded in breaking the old habit of copying

on the heels of the sender under strain. As a matter of fact, receiving behind, when you have formed the habit, is much easier, and you can make a neater, more accurate copy at greater speed with pen or "mill" than is possible in "close copying."

PIONEER RADIO OPERATORS

(Continued from Page 27)

and swore until Blakeney pulled Penn off the key.

"Penn's great delight was to send too fast to Harry Reynolds, here. Harry's a fine boy but he hasn't learned to receive fast stuff. One day we fixed it so Dibell would watch Penn at his station at Cripple Creek. At the other station here in Denver we had Reynolds but we also had Blakeney here which Penn did not know. Blakeney imitated Reynolds sending. Penn tried to burn up Reynolds, as he thought, with fast sending. The supposed Reynolds okayed, which gave Penn a surprise. Then the supposed Reynolds said, 'I have several for you.' Penn said GA. Blakeney started sending slow like Reynolds and speeded up and up. Penn stopped writing and gradually sat back in his chair looking at his electrolytic detector in amazement. Then Dibell and those who had quietly gathered back of him gave him the razzberry. After a while he got himself a job with somebody else, a broker I think, down Pueblo."

It was near midnight when Marriott's interesting tale was ended. A Denver Post reporter nailed me as we left the grill to get my views as to the possibilities of Pikes Peak as a site for a "world-girdling Wireless station!" But my mind was too filled with thoughts inspired by Marriott's career, of my wireless assistants, to give him much of a story.

Next morning Cooper took me to Boulder. There I met a local boy operator, Pickerill, "Pick," as he was destined to be known the whole American Wireless world over, and who still is "Commodore" of the SS "Leviathan," where for years now he has been better known and more of a fixture than the Captain of the ship.

But to Pickerill in Boulder, Colorado, Blakeney was a god as an operator. Doggedly Pick used to try to speed up to Blakeney's speed, but he simply couldn't keep his stuff plain when he hit 'er up. But he made good in every other respect then, and since. I shall have more to tell about Pickerill later on.

Years later, in 1910, I again met Blakeney in Los Angeles, where he was working on the Catalina circuit. Reynolds went on from the Colorado stations to Seattle, and was on the West coast ships for years. He visited Cooper and Marriott in Seattle and Bremerton in 1916, but have since then lost all track of the lad. I should like to hear from Harry again.

"High-pockets" Thomas who operated Pueblo in '05, is now a farmer on the Olympic Peninsula, I'm told. Charley Cooper, as most of you know, is a manufacturer's agent for several companies, and lives near Marriott, in Brooklyn. Swenson, who was Bob's assistant on the Catalina circuit in 1902, lives in Spokane. Carrol, the first operator on that circuit, later became a policeman in 'Frisco, and was killed by a train.

My stay in Colorado was busy but brief. I quickly saw that with Cooper and Marriott to direct installations, and with operators like Reynolds, Blakeney and Pickerill to pound brass, adjust electrolytic "whisker points" and break in new men, my presence was no longer needed.

And the Great Lakes were calling.

"Distress"

(Continued from Page 15)

"The mate made a pass at me, but I was quick in those days. I let the punch slide over my shoulder, while I gave him a push backward and he tripped over my obliging foot. He sat plump, right in the nice cold water. He looked up at me and cursed. I just laughed at him and told him I'd smack his silly country face if he tried to make another pass at me. So he just sat there and laughed back. Just a couple of fellows having some fun.

"I grabbed hold of the speaking tube and whistled a blast, that made my jaws ache, down to the engine room. The engineer answered, 'Whatsamatter now?'

"I yelled down, 'Listen, Oscar, I want more juice.'

"He yelled back, 'You want more juice, do you? Well, where the hell you going to get it? If I speed up the dynamo anymore I'll have to shut down the engine. The last of the boiler tubes are letting go, one by one.'

"Well, sir, that was nice news. Just one sweet happening after another.

"'All right. Cut me off again, for awhile,' I answered.

"I went out of the wheelhouse, back aft to the Captain, who was down below shoveling at the coal. I yelled down to him to come up on deck. He climbed up the ladder and joined me. What a nice sight he was, my Captain. Wet, black grime covered his face, except where streaks of sweat had made it gray. His clothes were wet and streaked with black.

"'Have you heard the latest?' I said to him.

"He answered wearily, 'No. What's happened now?'

"'I tried to get enough current to send to another ship and couldn't,' I said. 'I called the engineer and he told me he couldn't give me any more steam without shutting down the engine. The boiler tubes are letting go.'

"'Oh, hell! I thought we had slowed down,' he said. 'So that's why the water's getting higher in this hatch. Well, I guess we're done for. Come on along, son. We'll go down below and hear what he has to say himself.'

"We went along the slippery deck to the engine room. Down below we went, though I didn't feel much like going below in a ship that might sink at any moment. One could feel disaster as we climbed down the ladder. The engine was barely turning over now. The lights in the engine room were burning low. When we reached the engine room floor plates we saw that the engineer was going around lighting oil lamps preparatory to shutting down the dynamo.

"The Captain said to me, 'I can see that there's not much use asking him anything. It speaks for itself.' He waved his hand around the engine room.

"The engineer came over to us. 'I don't think it'll last much longer,' he said, 'I'll keep it going as long as I can, Captain.'

"'Yes, keep it turning over as long as you can,' the Captain said. 'The longer you can keep pumping water out of her, the longer we stay on top.'

"He turned to me, 'All right, son. Up on top for us.'

"'Yes, sir,' I said. 'Shall I send out a distress call?'

"'If you can.'

"'Then I guess he'll have to shut down the engine all together and give me what steam he has.'

"'Yes,' he said, 'Oscar, shut it down and give Sparks all the steam you can while he tries to get a ship to take us off.'

"We went up on deck, glad to get free from the imprisoning walls of below. In the wheelhouse I whistled down to the engineer, 'All right, let's go. Give us everything you got.'

"I started to pound brass. S-O-S. The current was weak and very little radiation showed on the ammeter. On the dots the tone picked up a little, on the dashes the tone fell to a low dying whine. The set whined up and down the scale, dots higher, dashes lower.

"I sent the distress call, signed my letters and listened. No response. I tried again. No response. Again. No answer. I sent another distress call and this time sent the position. I repeated. I did not know whether anyone was getting my signal, but that was all I could do. Broadcast it on the chance that someone might pick it up. Not a sound from the silent ether. I became nervous and tried to find more sensitive spots on the crystal. Somebody must be hearing me. Maybe it was the crystal and I could not hear their answer. I shifted to another crystal. More distress calls with our position. No answer.

"The captain came into the wireless room. He stood silently at my elbow. I looked up at him, 'No luck, Captain. No one seems to hear me.'

"'All right, son,' he said, 'just some more of our bad luck. I'll be abandoning ship soon now. You keep on sending until I call you.' He smiled sadly, 'I won't forget you, don't be afraid.'

"I smiled back at him. Pounded more brass. S-O-S S-O-S S-O-S. No answer. No answer to my signals, the air was dead. No one was working. There was not even the consolation of hearing some other ship calling. Silent ether.

"My key stopped spluttering. Aimlessly, I continued to pound the dead key, trying to evoke some life from it. At last it penetrated my consciousness. The dynamo—stopped. The engine—stopped. The ship rolled sickly, sluggishly in the heavy sea.

"I jumped up from my stool, ran into the wheelhouse. There was no man at the rolling wheel, no mate on the bridge. I heard shouts, ran out on the wing of the bridge. Looking aft, I saw the Captain and the mates, the engineers standing at the one lifeboat, with revolvers drawn. Forward of them the Chinese were gathered, gesticulating, crying in their high pitched voices. Their voices, fear-cracked, cried out to the clustered white men for rescue.

"Screeching, the Chinese ran at the white men. The revolvers blazed, plopped dully. Reports were muffled by bodies pushed against splitting guns. Men dropped to the deck, their need for rescue over. The mate and one of the engineers went down under the rush. The rear rank of the Chinese flowed over the white men. They snatched at the boat falls, tried to climb into the boat.

"The white men struck at them with empty pistols, wrenches, pins, their fists. They pulled struggling Chinese back out of the boat. Reloaded guns—fired again. Fallen men clutched their bellies, drew their knees up in agony. The remaining Chinese were thrown back, away from the boat.

"The Captain called out, 'Hey, Sparks. Come on along. Make it quick.'

"I tumbled down the ladder, ploughed through the Chinese, reached the boat.

"'All right, son.' the Captain said. He looked around him. 'Everybody here?'

"Everyone looked at his neighbor. There was a murmur, 'Yes, sir, everybody's here.'

"'Four of you into the boat,' the Captain's voice was sharp, 'keep her away from the ship's

side. Watch out now. Don't let it capsize.'

"The remaining mate, the donkeyman, the Chief and another engineer climbed into the boat. 'The rest of you hold onto the boat falls. Let it down easy. Watch it.'

"Slowly the boat fell away into the rolling sea. It bobbed up and down on the high swell. It rose to the deck, then fell away with a swift downward rush.

" 'All right, you men. Down the line. One at a time. Watch yourselves. Go ahead, Sparks.'

"Taking hold of the line, I climbed up on the rail, swayed precariously as the ship rolled. When the boat fell away into the pit of the sea, I slid. Slid down, down, with speed, burning speed. My hands were raw. I fell into the boat.

"One by one they followed me. Chinese and white. The Captain came last. He took his place at the rudder. 'Swing off away from her. Go ahead, you men, row.'

"I was up in the bow and had no oar. The others swung their oars and we slowly made our way from the sinking ship. We fell and rose on the waves. Shipped water that further wetted our sodden bodies. Bailed out. Slowly we made progress away from our ship.

"We crawled crabwise away. Our outflung oars pulled us forward while the waves threw us sideways. Now that we were away from the ship, our excitement dulled, the cold crept into us. We drew nearer to one another for warmth. Took hourly spells at the oars to try and get warm. Wind-flung salt spray stung blistered and cold-cracked hands that swung on an oar. Tiredly we bent and pulled, trying all the time to keep the boat headed into the seas, so that we would not be swamped. The Captain in his greatcoat, huddled in the stern, tried to keep us cheerful. 'Keep it up, boys. Don't get discouraged. We are bound to be rescued for we are right in the track.'

"Through the night we rowed until a pale sun made a gray murk of the black. It cheered us some to feel that the sun was shining for us again. With daylight, the sun became brighter and we became stronger. We rowed with more spirit. We felt that we must be rescued. That we could not fail after we had saved ourselves from that rotted hulk. What straws men clutch at in their hopefulness, and yet we were right.

"In the middle of the morning, the Captain sighted an oncoming ship. We rowed toward it. It saw us. We were rescued."

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Correspondence Section

(Continued from Page 19)

the olden days it used to be customary on all U. S. Shipping Board Vessels carrying but one Operator to have the Operator remain on board from 9.00 A. M. to 4.00 P. M., unless excused by the Master. Why couldn't the same rule prevail today on board all vessels carrying but one Radio Telegraphist, and on vessels carrying two or more Telegraphists, one to remain on board at all times while in port?

Paragraph 3 of said Operator's list submitted, read as follows: "Prohibit Operators from doing any class of work on the typewriter unless paid extra and according to the amount of work done. Same for any other class of work for the Mates and Captain."

This kind of work, whether typewriting, painting, chipping rust, running errands for the Captains or Officers, or any other kind of work, outside of what your Radio Operator's License actually calls for, should be abolished entirely and at once, regardless whether the Operator receives any or no pay for same, and as I have mentioned before in my letter, any Operator performing such duties is not fit to hold a Radio Operator's License and should not be granted a Radio Operator's License at all.

There is no doubt that the Radio Operating Profession is shot to H——; but it is my belief, and it may be yours too, that a good many of the Operators have but themselves to blame for the poor and miserable conditions existing today. I am talking from the bottom of my heart. I am not condemning my colleagues, that would be foolish on my part; but I am merely trying to impress upon the minds of my fellow men and operators that this profession is and should be respected as a Man's Profession, a position to which a great "responsibility" is attached. Therefore, when a young man enters this profession and goes on board his vessel as a Professional Radio-Telegraphist for the first time in his life, he should bear in mind that his "Amateur" days are over and a thing of the past, in other words he should get down to "Business" and act like a Man,—a Man to be respected in his line of Duty.

When this particular peak or point can be achieved or reached, then, and then only, the Operators as a whole can expect better wages and better working conditions on board ship; but as long as certain Operators keep on as "Amateurs" on board ship experimenting with "Ham" sets and disregarding their regular Radio Duties as well as neglecting the upkeep of the apparatus in general, just so long will we remain on the lowest level in the AMERICAN MERCHANT MARINE.

Well, I think I have said enough for this time, and believe me, it was a "load" off my chest; but it is all for the good, at least I hope so.

Signed, E. M. K.

Ship News

George I. Martin, superintendent of the Great Lakes district for RMCA has been temporarily transferred to RCA Institutes, Inc., 222 No. Bank Drive, Chicago, Ill. During his absence the duties at the Cleveland office are in the capable hands of Mrs. R. Reis and Frank Weide.

Norman Walker, MRI man for RMCA, is passing the winter months as relief operator on vessels of the Mississippi Valley Barge Lines.

Some of our passenger ship operators have original ways in dealing with customers. On the Manhattan recently a passenger inquired about the low rates on radiograms, and when told there was no low rate complained, "Well, I only have 65 cents for a message." So Roxy asked, "Well, can't you start a crap game or something?"

Heard on 800 meters. Navy Compass Station NSD: "Svc, to Master SS Munlousy—you will await your turn."

Did you hear about the poor guy who sent "SOS" and a couple of stations came back with "Wait 3 minutes"?

WCC, to a ship on short wave, "Your note has feathers on it, CM, if you get what I mean."

WCC, to some ship that asked for last night's news on the war in China—"Sorry OM, I can't say, as we don't get last night's news out here till next week."

Walter Baumgartner, on the SS Admiral Peoples out of Portland, is W7FE when at home.

C. B. Reynolds has been appointed Marine Radio Inspector at New Orleans.

Theodore Fisher is on the SS Polarine.

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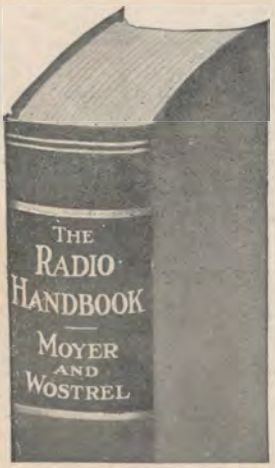

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